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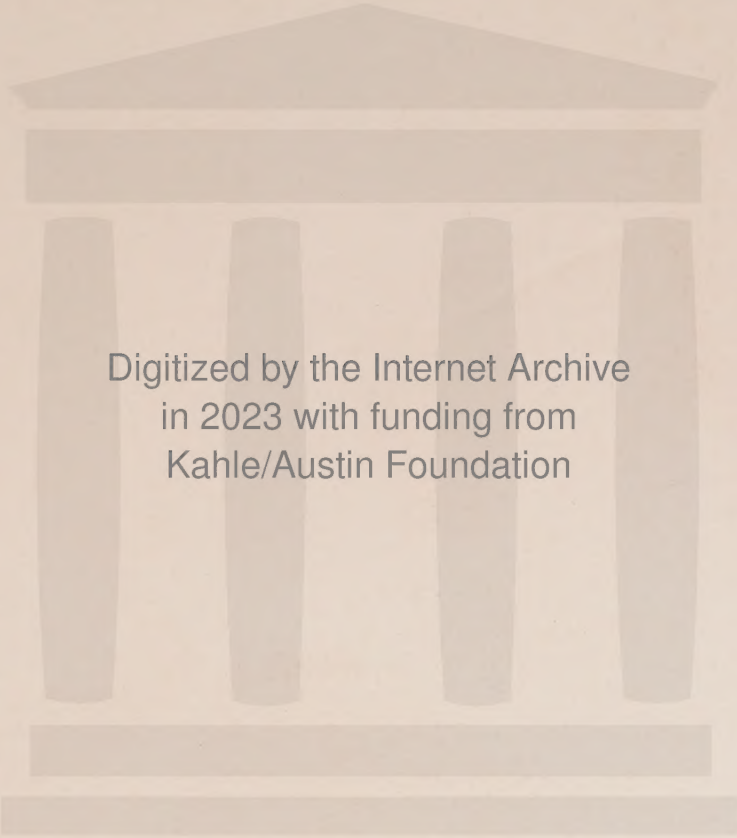
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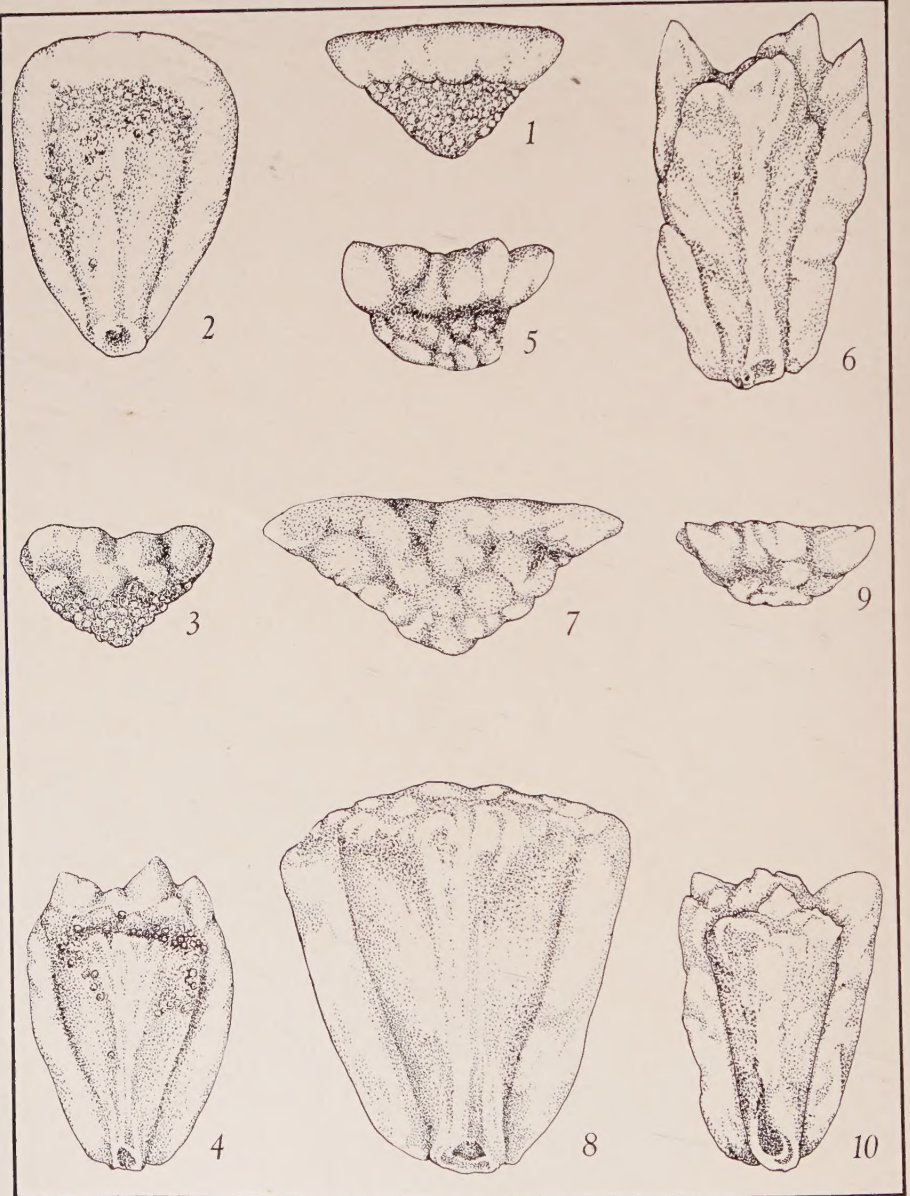
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Nutlets of *LYCOPUS*, $\times 28$.

- L. AMERICANUS*: FIG. 1, apical view; FIG. 2, ventral view.
L. UNIFLORUS: FIG. 3, apical view; FIG. 4, ventral view.
L. VIRGINICUS: FIG. 5, apical view; FIG. 6, ventral view.
L. ASPER: FIG. 7, apical view; FIG. 8, ventral view.
L. RUBELLUS: FIG. 9, apical view; FIG. 10, ventral view.

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DIAGNOSTIC CHARACTERISTICS IN LYCOPUS

FREDERICK J. HERMANN¹

(Plate 439)

DURING several summers of botanizing in Michigan the writer has noted the frequent occurrence of plants of *Lycopus americanus* Muhl. in which the pinnatifid or incised leaves commonly ascribed to that species were altogether lacking. Since this feature has been used almost invariably in the keys of our manuals as the sole character distinguishing *L. americanus* from its immediate allies of eastern North America it is not surprising that in herbaria we so often find the merely serrate-leaved individuals of this species referred to various other species. In attempting to find other diagnostic characteristics to supplement the traditional key character for *L. americanus* the pronounced individuality of its fruit became apparent as, indeed, did that of many of our other species.

It is remarkable that the characteristics of the nutlets in this genus (perhaps, for that matter, in the whole family) have received so little attention, particularly when we consider the importance attached to the morphology of the fruit in so many genera of the closely related *Boraginaceae*. And what study the nutlets have received (outside Penland's study of *Scutellaria*²) seems to have been largely superficial. Bentham,³ treating the *Labiatae* in DeCandolle's Prodrômus,

¹ Paper from the Department of Botany and Herbarium of the University of Michigan, no. 577.

² Penland in RHODORA 26: 61-79, plates 140 and 141. 1924.

³ Bentham in DeCandolle, Prodrômus 12: 177. 1848.

CONTRIBUTIONS FROM THE GRAY HERBARIUM OF HARVARD
UNIVERSITY—NO. CXVPLANTS FROM THE OUTER COASTAL PLAIN OF
VIRGINIA

M. L. FERNALD

(Plates 440-452)

CONTINUING¹ our field work in easternmost Virginia, my companions and I made four brief excursions in 1935 to the outer Coastal Plain; and during the season of 1936, as the guests of my former student, Professor Robert F. Smart at the University of Richmond, we have, similarly, had four trips to the inner Coastal Plain, adjacent to the Piedmont region of the state. In this report the plants of special significance collected in 1935 are chiefly discussed; in a later paper those of 1936 will be considered.

Geologically, the Coastal Plain in the southeastern corner of Virginia has two sharply differentiated areas: west of the Dismal Swamp the region consists of Tertiary deposits, with beds of Miocene fossil shells underlying the superficial sands, clays and peats; east of the Dismal Swamp and south of the entrance to Chesapeake Bay the Tertiary beds are deeply buried under Quaternary sands and clays. The reflection in the flora of this difference in surface soils is vivid and will be more fully considered in a succeeding paper. There is, of course, a general floral similarity and the majority of species are identical in the two areas: *Pinus Taeda*,² *Taxodium distichum*, *Arundinaria tecta*, *Uniola laxa*, *Danthonia sericea*, *Tripsacum dactyloides*, *Cyperus pseudovegetus*, *ovularis* and *lancastriensis*, *Eleocharis simplex* and *tuberosa*, *Rhynchospora corniculata*, *cymosa* and *inexpansa*, *Carex styloflexa*, *abscondita* Mackenzie and *verrucosa*, *Xyris caroliniana* and *difformis*, *Commelina virginica*, *Juncus setaceus*, *debilis*, *scirpoides* and *marginatus*, *Smilax rotundifolia*, *Bona-nox* and *Walteri*, *Iris virginiana*, *Habenaria cristata*, *Tipularia discolor*, *Saururus cernuus*, *Populus heterophylla*, *Carya alba* and *glabra*, *Myrica cerifera*, *Carpinus caroliniana*, *Betula nigra*, *Fagus grandifolia*, *Quercus alba*, *falcata*, *nigra*, *phellos* and *stellata*, *Morus rubra*, *Magnolia virginiana*,

¹ See Fernald & Griscom, *Three Days of Botanizing in Southeastern Virginia*, RHODORA, xxxvii. 129-157 and 167-189 (1935)—Contrib. Gray Herb. no. CVII. Also Fernald, *Midsummer Vascular Plants of Southeastern Virginia*, RHODORA, xxxvii. 378-413, 423-554 (1935)—Contrib. Gray Herb. no. CIX.

² Authors are given only for names not in Gray's Manual.

Itea virginica, *Liquidambar styraciflua*, *Rosa palustris*, *Tephrosia spicata*, *Desmodium nudiflorum*, *viridiflorum* and *lineatum*, *Clitoria mariana*, *Centrosema virginianum*, *Polygala incarnata*, *Rhus copallina*, *Ilex glabra*, *Euonymus americanus*, *Berchemia scandens*, *Vitis rotundifolia*, *Hibiscus Moscheutos*, *Ascyrum stans*, *Hypericum petiolatum*, *Helianthemum canadense*, *Passiflora incarnata*, *Ludwigia alternifolia* and *glandulosa*, *Aralia spinosa*, *Cornus stricta*, *Nyssa aquatica*, *Oxydendrum arboreum*, *Vaccinium stamineum*, *Diospyros virginiana*, *Symplocos tinctoria*, *Fraxinus caroliniana*, *Gelsemium sempervirens*, *Sabatia angularis*, *Asclepias variegata*, *Ipomoea pandurata*, *Callicarpa americana*, *Scutellaria ovalifolia* Pers., *Monarda punctata*, *Mimulus alatus*, *Gratiola pilosa*, *Bacopa acuminata*, *Bignonia capreolata*, *Oldenlandia uniflora*, *Viburnum nudum*, *Lobelia puberula*, *Elephantopus nudatus* and *tomentosus*, *Eupatorium coelestinum*, *Chrysopsis graminifolia*, *Solidago pinetorum* Small, *Aster gracilis*, *Pluchea foetida*, *Helianthus atrorubens*, *Verbesina occidentalis* and *Pyrrhopappus carolinianus*. These and hundreds of others abound in their proper habitats both east and west of the Dismal Swamp.

To the eastward, on the outer half of the Coastal Plain in Norfolk and Princess Anne Counties, other scores of species are found which we do not know on the inner half of the Coastal Plain in Virginia or which are there highly localized. Some of these have been noted in two preceding papers; others are here to be specially discussed. This large flora, in Virginia restricted to or best developed in the two southeastern counties, includes such very characteristic plants as *Pinus serotina*, *Typha truxillensis* HBK., *Sagittaria falcata* Pursh, *Triglochin striata*, *Limnobiium Spongia*, *Uniola paniculata*, *Sacciolepis striata*, *Cyperus Haspan*, *Eleocharis quadrangulata*, *Fimbristylis puberula* and *Baldwiniana* (Schultes) Torr., *Fuirena squarrosa*, *Rhynchospora fascicularis* (Michx.) Vahl, *Cladium jamaicense* Crantz, *Scleria setacea* Poir., *Lemna valdiviana*, *Myrica pensilvanica* Loisel., *Quercus virginiana* and *cinerea* Michx., *Arenaria lanuginosa* (Michx.) Rohrb., *Ranunculus hederaceus* and *pusillus*, *Persea palustris* (Raf.) Sarg., *Drosera intermedia* Hayne, *Decumaria barbara*, *Crataegus Youngii* Sarg., *Linum medium* var. *texanum* (Planch.) Fern., *Xanthoxylum Clava-Herculis*, *Ilex vomitoria*, *Ampelopsis arborea*, *Viola pectinata*, *Ludwigia pilosa* Walt. and *brevipes* (Long) E. H. Eames, *Eryngium aquaticum*, *Centella repanda* (Pers.) Small, *Vaccinium*

macrocarpon, *Sabatia gracilis*, *Asclepias lanceolata*, *Dichondra repens* Forst. var. *caroliniensis* (Michx.) Choisy, *Lippia nodiflora* and *lanceolata*, *Bacopa Monnieria* var. *cuneifolia* (Michx.) Fern., *Galium hispidulum*, *Lobelia elongata* Small, *Eupatorium serotinum*, *Erigeron vernus* and numerous others. Some of these are obviously controlled by proximity to the sea, but brackish water extends far up the James and its tributaries, nearly to the Fall Line, and dry white sands with plants characteristic of Cape Henry occasionally occur inland.

West of the Dismal Swamp, from Nansemond County to the Fall Line, the characteristic or distinctive plants are more numerous. In 1935 this area was only slightly examined, chiefly in the region of Kilby (west of Suffolk), but even in that brief half-day the contrast with Norfolk and Princess Anne Counties was striking, in the occurrence of such plants (not seen by us farther east) as *Polypodium polypodioides*, *Pinus echinata*, *Uniola latifolia*, *Gymnopogon ambiguus*, *Fuirena hispida*, *Scleria pauciflora*, *Uvularia puberula*, *Aletris farinosa*, *Hypoxis micrantha* Pollard, *Iris verna*, *Habenaria ciliaris*, *Malaxis n. sp.*, *Ulmus alata*, *Asarum virginianum*, *Psoralea pedunculata*, *Rhynchosia erecta* and *tomentosa*, *Polygala Curtissii*, *Lyonia mariana*, *Vaccinium virgatum* var. *tenellum*, *Solidago yadkinensis*, *Aster patens* and *linariifolius*, *Parthenium integrifolium* and *Arnica acaulis*. These species, all occurring westward into either Southampton, Greenville, Sussex, Dinwiddie, Prince George or Chesterfield County or into more than one of them, consequently belong to the very extensive flora more particularly examined in 1936, to be discussed in a later paper.

Our collecting trips in easternmost Virginia in 1935 were four. In May (4-8) Mr. Ludlow Griscom and I centered again at Virginia Beach and drove over as much territory in Princess Anne and Norfolk as the limited time would allow. Spring vegetation was in its prime, with some species already passed or passing, and again we were impressed by the Alleghenian element in the flora of these coastal counties, such inland plants as *Liparis liliifolia*, *Dentaria laciniata*, *Oxalis violacea*, *Galax aphylla* and *Carex digitalis* seeming almost out of place. *Carex* was already in good condition and we were able to extend the ranges northward into Virginia of *C. flaccosperma* and *C. folliculata* var. *australis* Bailey (*C. Smalliana* Mackenz.). *Arisaema* presented new problems for solution and some other questions arose, to be dealt with in this or in a subsequent series of studies with Mr. Griscom.

In June (16-21) Mr. Bayard Long was, happily, able to join us. The same general area, with a flora strikingly unlike the spring flowers of our earlier trip, was again covered. The rich woodlands of Great Neck and of Little Neck (projecting into Lynnhaven Bay) yielded further surprises, including a remarkable new *Juncus*, simulating *J. effusus*, but with the capsule strongly beaked as in the famously localized *J. gymnocarpus* Coville. A strange *Bumelia*, discovered by Griscom and me in young foliage in May, was now coming into flower (collected by Long and me in mature fruit in September). One of the most productive trips included a brief landing at the southern end of Cedar Island, in Back Bay. Here, bordering marshes characterized by *Phalaris caroliniana* Walt. and other good species, the low woods, cut off from the open Atlantic only by the sandy outer bar of False Cape, suggested bottomlands of the rich Alleghenian forest, with lush tangles of *Elymus villosus* Muhl. and other Alleghenian types. Most surprising, however, was the occurrence of *Iresine rhizomatosa* Standl., a species heretofore known only from the interior (Texas to Kansas, east to Alabama and western Maryland). Obviously, Cedar Island needs more attention.

In September (5-13) Griscom, unfortunately, was unable to join us but we had a happy substitute in Professor John M. Fogg of the University of Pennsylvania, who joined Long and me with his car at Virginia Beach. Although Griscom and I had centered here in September, 1933, when we covered only the immediate vicinity, subsequent visits had introduced us to many stations in Princess Anne and Norfolk Counties, where the late-summer and autumn-flowering *Compositae*, *Gramineae* and *Cyperaceae* were bound to be interesting. This proved to be the case and when we were obliged to leave it was with full realization of the many spots where real discoveries can yet be made.

During this trip we ventured westward into Nansemond County, as already noted, and returning to Philadelphia and Cambridge, we crossed from Norfolk (or Willoughby Neck) to Old Point, thence to Yorktown and Fredericksburg. This was new territory for us, but, realizing that the Peninsula of Virginia (between the lower James to the south and the lower York to the north) had been well studied by the late Earl J. Grimes and Mrs. Grimes (later Mrs. Erlanson), we expected no special novelties. Having two hours of daylight which could be used, we decided to look for an unspoiled spot near Hampton.

In this we were partly successful; at least the clearing and peaty thicket where we stopped had its original flora largely undisturbed and, quite unwittingly, we added a considerable number of local species to the lists of the Grimes's collections¹: *Lycopodium alopecuroides*, *Andropogon Elliottii*, *Cyperus sabulosus* Mart. & Schrad., *Rhynchospora cymosa*, *Lechea Leggettii*, *Helianthus angustifolius*, and a remarkable and very handsome new *Aster*, to be described toward the end of this paper—a good two-hour's gleaning. Nearby, in disturbed soil, the Asiatic *Arthraxon hispidus* var. *cryptantherus* (Hack.) Houda, new to Virginia, was abundant.

It was already twilight when we approached Yorktown; but we were tempted to take a look at one or two of the "bays" or peaty and sandy depressions in the woods. Such depressions seemed to us the counterparts of the kettle-holes of Cape Cod, doubtless of different origin but with resultant belts of similar wet and successively drier and drier sand. One was filled with the giant *Rhynchospora corniculata*, not in any of the Grimes lists. Another (the only one we had time to search, on hands and knees in essential darkness), close to the road, made us think of Cape Cod, through the abundance of *Stachys hyssopifolia*, not in the Grimes lists. Here, likewise new to the Peninsula, were other species: *Solidago pinetorum* Small and *Pluchea viscida* (Raf.) House (*P. petiolata* Cass.). Several such "bays" were noted in the dark, to the south of Yorktown; and after the moon rose we saw more to the northwest of Gloucester (John Clayton's home). On Cape Cod every such depression has its peculiarly localized species; if this be so on the peninsulas of Virginia, as it doubtless is, there will be good botanizing there for years to come.

With only limited time and then only by "cutting" classes, I was able to get off for a short time in October (11–16). Long was with me, for, with his detailed knowledge of Coastal Plain plants and their proper habitats and his unequalled persistence and skill in finding them, no critical botanizing in eastern Virginia can be wholly successful without him. Fogg joined us Saturday night with his car. This time we economized time by stopping north of Cape Charles, instead of crossing Chesapeake Bay to the southeastern counties. Here, on the Eastern Shore, we had a most interesting center at historic and

¹ See (1) Grimes, *Some Plants of the Virginia Coastal Plain*, RHODORA, xxiv. 148–152 (1922); (2) Weatherby, *Critical Plants of Atlantic North America*, RHODORA, xxv. 17–23 (1923); (3) Eileen Whitehead Erlanson, *The Flora of the Peninsula of Virginia*, Pap. Mich. Acad. Sci. Arts and Let. iv. 115–182 (1924).

fascinating Eastville. We got essentially to the tip of Cape Charles (Kiptopeke) and left that area with the regret we had so often felt on having to quit, that there was a great deal yet to do. Many of the species which come north to Cape Henry are unknown on Cape Charles; several, supposed to reach their northern limit south of the Bay, are actually found north of it: *Andropogon scoparius*, var. *tenuispatheus* (Nash) Fern. & Grise., *Paspalum setaceum* var. *supinum* (Bosc.) Trin., *Panicum anceps* var. *rhizomatum* (Hitchc. & Chase) Fern., *Axonopus furcatus*, *Uniola paniculata*, *Rhynchospora inexpansa*, *Nothoscordum bivalve*, *Quercus virginiana*, *Xanthoxylum Clava-Herculis*, *Galium uniflorum*, etc. But the most interesting species are those southern types which we do not know in Princess Anne and Norfolk Counties but which are in Northampton or Accomac County to the north. To this series belong the following: *Najas guadalupensis* (but extending locally to Massachusetts), *Wolffia punctata* (first in the East north of Florida), *Baptisia alba* (stations discovered by Dr. Robert Tatnall), a new variety of *Cassia nictitans* (otherwise known only near Elizabeth City, North Carolina), *Polygala lutea* (common west of Norfolk County), *Ludwigia palustris* var. *nana* Fern. & Grise. (the first north of Georgia, but subsequently found to be common west of Norfolk County), *Utricularia virgatula* Barnh. (locally north to Long Island), *Aster concolor* (locally north to Martha's Vineyard), *Solidago ludoviciana* (Gray) Small (frequent west of Norfolk County and in southern New Jersey), and *S. tortifolia*, common (one station in Princess Anne County). Extensions southward were also noted, particularly of *Cyperus Engelmanni* (first south of New York), abundant in close proximity to *Wolffia punctata* at its northern limit in the Atlantic States. Another plant of extraordinary interest was *Carex arenaria*. Ordinarily ranked as a casual and non-persistent introduction in America, *Carex arenaria* forms, from Savage Point to Kiptopeke (or at least in both areas) an apparently indigenous element in the sand-dune vegetation, forming a turf near the crests of wooded dunes or in the shade of the dwarfed pines. It appeared as native as the strictly endemic plants with which it grows and did not seem to us to have the aggressive and non-fastidious habits of successful modern introductions. Leaving Eastville with the usual regret that we had failed to visit many areas which would have yielded additional novelties, we closed the field work for 1935 and the detailed study of the collections began.

In the following notes I have followed the procedure of the last paper on Virginia, of recording such species and stations as seem to be significant in the working out of a fuller knowledge of the flora of the state. Although primarily a record of collections made in 1935, note is made of earlier or later collections in a few cases. The names of species newly recorded (or seemingly so) from the state are preceded by an asterisk.

In some cases revisions of groups suggested by the work on our plants have been included. In many cases illustration has seemed important to clarify the discussions. The photographs have been made by E. C. OGDEN, the cost covered largely by a grant from the MILTON FUND FOR RESEARCH, in part by an appropriation from the WYETH FUND of the Division of Biology, both of Harvard University. The drawings of *Malaxis* were made by RUTH PEABODY ROSSBACH. The large expense of reproducing the photographs has been most generously met by my companion on most of the trips and the modest discoverer of most of the specialties, BAYARD LONG.

ENUMERATION OF NOTEWORTHY SPECIES COLLECTED¹

LYCOPodium alopecuroides L. Apparently very local in eastern Virginia, not collected by Kearney or by Grimes. ELIZABETH CITY COUNTY: peaty depressions in woods and bushy clearings west of Hampton, *F. L. & F.*, no. 4738. PRINCE GEORGE COUNTY: sphagnous boggy swale southeast of Petersburg, at head of Poo Run, *F. & L.*, no. 5969.

LYCOPodium inundatum L.

So far as is shown in the Gray Herbarium *L. inundatum* is represented in the Coastal Plain of Virginia only by vars. *adpressum* Chapm. and *Bigelovii* Tuckerm. The two have been much confused. In general var. *adpressum* has the mature strobiles only 3–6 mm. thick, with tightly appressed sporophylls; var. *Bigelovii* having strobiles 5–13 mm. thick, with loosely ascending to finally spreading sporophylls. The two definitely merge and var. *Bigelovii* clearly passes northward into typical *L. inundatum*. The Virginia collections before me are as follows.

Var. *ADPRESSUM* Chapm. ARLINGTON COUNTY: clay pit, near Rosslyn, *Blake*, no. 8936 (as *L. adpressum*). NORTHAMPTON COUNTY:

¹ To save space the collectors are indicated (except in formal descriptions and revisions) by initials: *F. & G.* (*Fernald & Griscom*); *F. G. & L.* (*Fernald, Griscom & Long*); *F. & L.* (*Fernald & Long*); *F. L. & F.* (*Fernald, Long & Fogg*); *F. L. & S.* (*Fernald, Long & Smart* in June and October, 1936).

moist depressions in sand dunes, Savage Neck, *F. L. & F.*, no. 5172 (as var. *Bigelovii*). JAMES CITY COUNTY: moist ditch, northwest of Williamsburg, *Grimes*, no. 3908 (as var. *Bigelovii*). DINWIDDIE COUNTY: boggy woods near head of Old Town Creek, southwest of Petersburg, *F. & L.*, no. 5968. SUSSEX COUNTY: sandy and peaty depression, about 4 miles northwest of Homeville, *F. & L.*, no. 5967; spring-fed wooded sphagnous bog, Coddysore, *F. L. & S.*, no. 6753. PRINCESS ANNE COUNTY: shallow water, Cape Henry, *L. F. & F. R. Randolph* (as *L. alopecuroides*); damp sandy flats back of the dunes, Rifle Range, *F. & L.*, no. 3616 (as var. *Bigelovii*).

Var. *BIGELOVII* Tuckerm. ARLINGTON COUNTY: clay pit, near Rosslyn, *Blake*, no. 8937 (as *L. alopecuroides*). SUSSEX COUNTY: sandy and peaty depression, about 4 miles northwest of Homeville, *F. & L.*, no. 5966. PRINCESS ANNE COUNTY: wet peaty depressions in sandy pineland, the Desert, Cape Henry, *F. & L.*, no. 3615.

SELAGINELLA APODA (L.) Fern. Not collected by either Kearney or Grimes. Frequent in the eastern counties, chiefly in rich woods and sandy alluvium; numerous collections.

PINUS VIRGINIANA Mill. Not noted by Kearney; rare in the two southeastern counties but frequent on the Eastern Shore and in the region from Nansemond County westward. PRINCESS ANNE COUNTY: a small stand in dry woods at the tip of Little Neck, *F. & L.*, no. 4740.

**SPARGANIUM ANDROCLADUM* (Engelm.) Morong (*S. lucidum* Fern. & Eames). See Fernald, *RHODORA*, xxiv. 27 (1922). PRINCESS ANNE COUNTY: shallow water, northwest branch of Salt Pond, *L. F. & F. R. Randolph*, no. 468 (as *S. americanum*); swale back of the dunes, Sand Bridge, *F. G. & L.*, no. 4531.

Range extended south from Pennsylvania. Earlier records (Kearney, etc.) of *S. androcladum* belong to the branched state of *S. americanum* Nutt.

NAJAS GUADALUPENSIS (Spreng.) Morong. NORTHAMPTON COUNTY: sandy margin of the largest pond in the woods back of the dunes, Savage Neck, *F. L. & F.*, no. 5174.

RUPPIA MARITIMA L., var. *LONGIPES* Hagstrom. Not recorded by Kearney. PRINCESS ANNE COUNTY: fresh to slightly brackish water of Back Bay, off north end of Knott's Island, July 23, 1918, *R. M. Harper*; Back Bay, off Cedar Island, *F. G. & L.*, no. 4532.

POTAMOGETON PECTINATUS L. Not recorded by Kearney. Abundant in fresh to slightly brackish water of Back Bay, July 23, 1918, *R. M. Harper*, also 1935, *F. G. & L.*, no. 4533.

P. PULCHER Tuckerm. PRINCESS ANNE COUNTY: brook entering Nowney Creek, Back Bay, *F. G. & L.*, no. 4535. NORFOLK COUNTY: in a stream near Cornland, *F. & G.*, no. 4295.

Although *Potamogeton pulcher* is not listed by Kearney, it is probable that his *P. lonchites* from the Dismal Swamp belongs here. The species is frequent west of the Dismal Swamp.

TRIGLOCHIN STRIATA Ruiz & Pavon. PRINCESS ANNE COUNTY: muddy banks and open spots in swales along North Landing River, near Creed's, *F. L. & F.*, no. 4741.

Although known locally in Delaware, and reported from Virginia (by Buchenau), ours is the first material in the Gray Herbarium from between Delaware and Florida, except a sheet of Canby's which might have come from anywhere between Delaware and Cape Charles. Not noted by Kearney.

SAGITTARIA LATIFOLIA Willd., var. PUBESCENS (Muhl.) J. G. Sm. PRINCESS ANNE COUNTY: open swamp near Oceana, *F. & L.*, no. 4743.

Not recorded by Kearney and surely local in the two southeastern counties; frequent in the counties west of the Dismal Swamp.

*LIMNOBIUM SPONGIA (Bosc) Richard. PRINCESS ANNE COUNTY: in water of cove, southern end of Lake Joyce, *F. & G.*, no. 4296 (young foliage, in May, floating, the blades conspicuously inflated beneath), *F. L. & F.*, no. 4744 (flowering and fruiting, in September, the newer leaves erect and without inflation).

First material in the Gray Herbarium from between Georgia and Delaware. I find no record from Virginia.

VALLISNERIA AMERICANA Michx. PRINCESS ANNE COUNTY: small plants drifted ashore, southern end of Lake Joyce, *F. L. & F.*, no. 4745.

Not recorded by Kearney.

ERAGROSTIS HIRSUTA (Michx.) Nees. Recorded as common in Princess Anne and Norfolk Counties in RHODORA, xxxvii. 134 (1935). Also common in NORTHAMPTON COUNTY: Eastville, *F. & L.*, no. 5219; Kiptopeke, *F. L. & F.*, no. 5220.

UNIOLA PANICULATA L. NORTHAMPTON COUNTY: sandy beach of Chesapeake Bay, west of Kiptopeke, *F. L. & F.*, no. 5221.

Hitchcock (Man. 180) states the northern limit as Cape Henry.

U. SESSILIFLORA Poir. To Grimes's station in James City County add PRINCESS ANNE COUNTY: rich dry woods, Great Neck, *F. G. & L.*, no. 4559, *F. & L.*, no. 4799. SOUTHAMPTON COUNTY: rich woods, southeast of Ivor, *F. & L.*, no. 6777.

Kearney recorded it (as *Uniola longifolia*) from Virginia Beach.

MELICA MUTICA Walt. PRINCESS ANNE COUNTY: rich woods, Cedar Island, *F. G. & L.*, no. 4560.

A notable colony, in the low woods of Cedar Island in Back Bay, at the outer margin of the Coastal Plain. The habitat given by Hitchcock (Man. 203) is "Rocky woods." Cedar Island is fully 85 miles east of the Fall Line in Greenville County, where the nearest

"rocks" are found. Virginia Beach, Kearney's station, is likewise on the outer margin of the state.

TRIODIA FLAVA (L.) Hitchc., var. *CHAPMANI* (Small) Fern. & Griseb. in *RHODORA*, xxxvii. 133 (1935). To the station recorded at Cape Henry add *NANSEMOND COUNTY*: dry sandy woods along Pitch Kettle Creek, north of Lake Kilby, *F. L. & F.*, no. 4795; dry sandy woods, Factory Hill, *F. & L.*, no. 6518.

ELYMUS VILLOSUS Muhl. (*E. striatus* of Am. auth., not Willd.). See Fernald, *RHODORA*, xxxv. 193 (1933). *PRINCESS ANNE COUNTY*: rich woods, Cedar Island, *F. G. & L.*, no. 4554.

Extraordinarily large (1.2 m. high), with leaves 1 cm. broad and inflorescences 1.5 dm. long; a species of rich woods of the interior, here at the outer margin of the Coastal Plain. Not listed by Kearney.

AGROSTIS ELATA (Pursh) Trin. For discussion of specific characters see Fernald, *RHODORA*, xxxv. 211 (1933). *NORTHAMPTON COUNTY*: peaty clearing, south of Townsend, *F. L. & F.*, no. 5212.

ARISTIDA PURPURASCENS Poir., var. *MINOR* Vasey. For discussion of characters see Fernald & Griscom, *RHODORA*, xxxvii. 136 (1935). *NORTHAMPTON COUNTY*: dry sandy pine woods, Eastville, *F. & L.*, no. 5210.

Extension north from Norfolk County.

PHALARIS CAROLINIANA Walt. *PRINCESS ANNE COUNTY*: border of brackish marsh, Cedar Island, *F. G. & L.*, no. 4547.

Not recorded by Kearney.

THE VARIETIES OF *LEERSIA VIRGINICA* (PLATE 440, all FIGS. $\times 10$). In *Princess Anne County* *Leersia virginica* Willd. is represented by two quite dissimilar plants. One, a delicate plant of damp rich woodlands and their bordering ditches, has the whitish-green spikelets (FIGS. 1 and 2) very minutely and remotely setulose-puberulent, with margins smooth or at most very short-ciliate; the other, a coarser plant of river-swales, almost as coarse as *L. oryzoides* (L.) Swartz, has the spikelets (FIG. 9) greener, rather larger, with more prominent ribbing and a positive ciliation of elongate hairs or bristles.

Study of a large series of material shows that *L. virginica* throughout much of its range breaks into the two variations which we noted in Virginia. The size of plant, breadth of leaf and size of spikelet vary in both, but one series (FIGS. 1-8) has the spikelets with smooth or barely ciliate margins, the other (FIGS. 9-13) has the margins coarsely ciliate-hispid. In view of this strong divergence it is important to know which extreme formed the basis of *L. virginica* Willd. Sp. Pl. i. 325 (1797). It is also necessary to identify the type

of *L. imbricata* Poir. in Lam. Encyc. Suppl. iii. 329 (1813). Fortunately this is quickly possible, through the fact that on his last trip to Europe, in 1935, the late Professor A. S. Hitchcock secured fragments for the National Herbarium from each of them. These have been most generously loaned me by Mrs. Agnes Chase. FIGS. 3 and 4 shows spikelets from the type of *L. virginica* at Berlin, $\times 10$, FIG. 5 those of the type of *L. imbricata* at Paris, $\times 10$. That they are both the extreme with essentially smooth-margined spikelets is evident. FIG. 6 shows spikelets (unusually large) of typical *L. virginica* from near Montreal (*Victorin*, no. 24,361); FIG. 7 from New York (Vaughans, Aug. 4, 1897, *Burnham*); FIGS. 1 and 2 from Virginia (*Fernald & Long*, no. 4781) and fig. 8 from Illinois (Peoria, August, 1903, *McDonald*). Mrs. Chase informs me that "*Leersia ovata* Poir., which has been referred to *L. lenticularis*, is *L. virginica* with cilia on the lemma about 0.5 mm. long." The extreme plant with bristly-ciliate spikelets should, therefore, be called

LEERSIA VIRGINICA* Willd., var. **ovata (Poir.), comb. nov. *L. ovata* Poir. in Lam. Encycl. Suppl. iii. 329 (1813).

FIG. 9 shows the spikelets of var. *ovata* from North Landing River, Virginia, *Fernald, Long & Fogg*, no. 4782; FIG. 10 from Ithaca, New York, *Metcalf*, no. 1576; FIG. 11 from Lancaster Co., Pennsylvania, *Heller*, no. 4796; FIG. 13 from Fort Snelling, Minnesota, *Mearns*, no. 770; and FIG. 12 from Apalachicola, Florida, *Chapman*.

DIGITARIA FILIFORMIS (L.) Koeler, var. *VILLOSA* (Walt.) Fern. in *RHODORA*, xxxvi. 19 (1934). NORTHAMPTON COUNTY: crest of sandy and argillaceous bluff along Chesapeake Bay, Old Town Neck, *F. L. & F.* no. 5193. NANSEMOND COUNTY: dry sandy bank along Pitch Kettle Creek, north of Lake Kilby, *F. L. & F.*, no. 4759.

Not listed by Kearney.

AXONOPUS FURCATUS (Flügge) Hitchc. NORTHAMPTON COUNTY: moist peaty depression in pine woods south of Townsend, *F. L. & F.*, no. 5207; SOUTHAMPTON COUNTY: open sandy borders of pools and depressions in bottomland of Nottoway River, Courtland, *F. & L.*, no. 6470.

Extensions north and west from Princess Anne County.

PASPALUM SETACEUM Michx., var. *SUPINUM* (Bosc) Trin. (*P. supinum* Bosc). See *Fernald, RHODORA*, xxxvii. 390 (1935). NORTHAMPTON COUNTY: dry sandy pine woods, Eastville, *F. & L.*, no. 5192.

Extension north from Cape Henry.

P. DILATATUM Poir. NORTHAMPTON COUNTY: dry sandy and

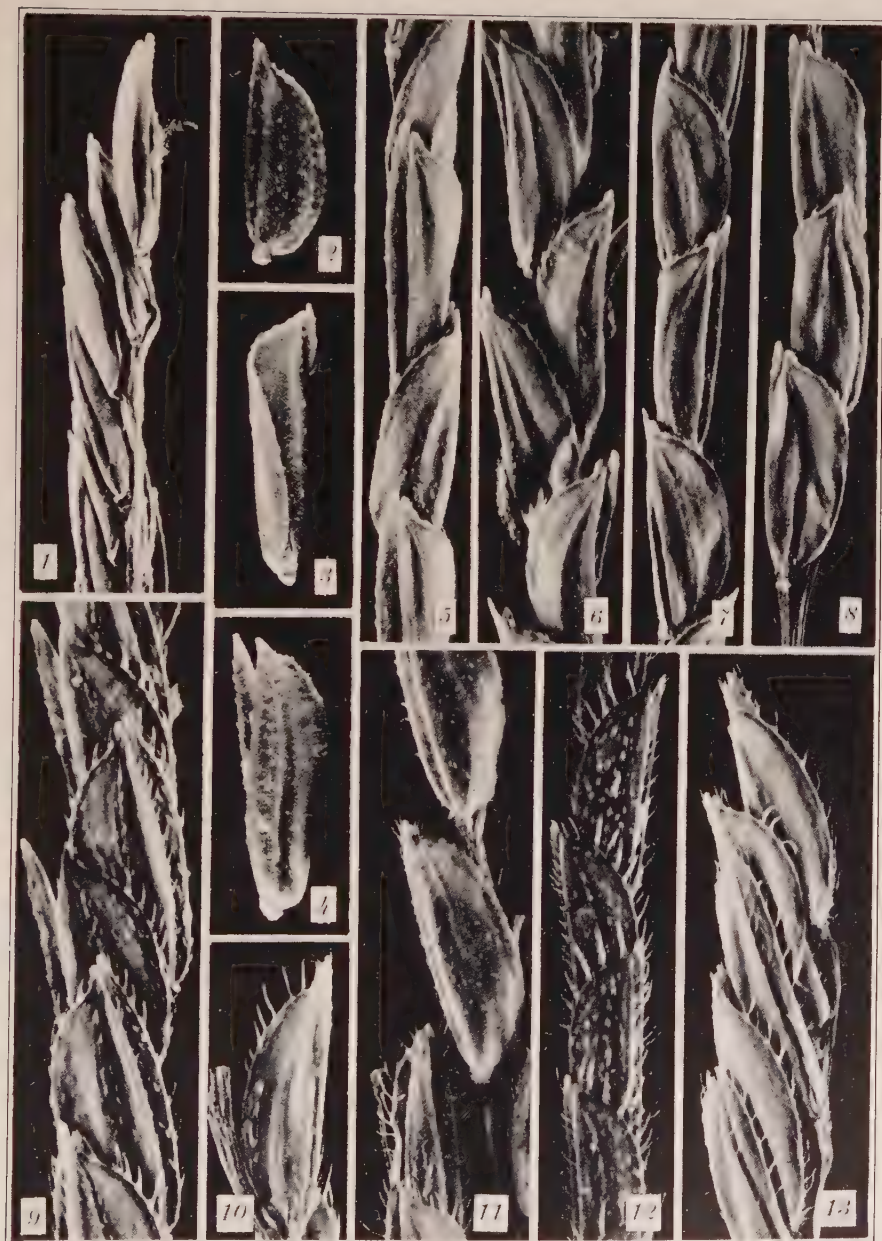


Photo. E. C. Ogden

Spikelets of *LEERSIA VIRGINICA*, $\times 10$. FIGS. 1-8, typical *L. VIRGINICA*; FIGS. 3 and 4, from TYPE of the species; FIG. 5, from TYPE of *L. IMBRICATA*. FIGS. 9-13, var. *OVATA*.



Photo. E. C. Ogden.

FIG. 1. *Panicum dichotomiflorum*; FIG. 2, var. *geniculatum*; both $\times \frac{2}{5}$.

argillaceous pine woods back of the shore-bluff, west of Kiptopeke, *F. L. & F.*, no. 5191; grassy roadside, Eastville, *F. & L.*, no. 5190.

Slight northern extension. Although Mrs. Chase, *N. Am. Sp. Pasp.* (*Contrib. U. S. Nat. Herb.* xxviii.), 172, extends the range north to New Jersey, the extension is based only on material from waste land in Camden in 1882, where the plant was not indigenous nor persistent.

P. BOSCIANUM Flüge. PRINCESS ANNE COUNTY: wet, argillaceous thickets and ditches, Rosemont, *F. & L.*, no. 4756. SOUTHAMPTON COUNTY: sandy alluvium, bottomland of Blackwater River, near Oak Grove School, *F. & L.*, no. 6462. NANSEMOND COUNTY: roadside ditch, Factory Hill, *F. & L.*, no. 6765.

Recorded by Mrs. Chase only from Norfolk County and the Dismal Swamp. The colloquial name "Bull Grass," coupled with the specific name and that of its author, ameliorates the tediousness of an often dry subject.

PANICUM DICHOTOMIFLORUM Michx., var. **geniculatum** (Wood), comb. nov. PLATE 441, FIG. 2. *P. miliaceum* ? Walt. *Fl. Carol.* 72 (1788), not L. (1753). *P. geniculatum* Ell. *Sk. i.* 117 (1816), as to plant described, not Muhl. (1813). *P. retrofractum* Delile in Desv. *Opusc.* 96 (1831). *P. proliferum*, β . *geniculatum* Wood, *Am. Bot. Fl. ed.* of 1873: 392 (1873).

Even after the segregation of the hispid-sheathed and coarse Floridan and Bahaman var. *bartowense*¹ and the slender and small-flowered northern var. *puritanorum* Svenson in *RHODORA*, xxii. 154, figs. 1-5 (1920), *Panicum dichotomiflorum* Michx. consists of two very distinct but usually unrecognized geographic varieties in temperate North America. In New England and much of the coastwise region, extending locally into the interior, the common plant (no. 1, our FIG. 2) when well developed, has a coarse and geniculate stem, with enlarged lower nodes, inflated lower and primary sheaths, panicles eventually borne at most of the nodes, the peduncle included in the sheath or only short-exserted, the stiffish branches of the panicle soon horizontally divergent to finally reflexed, the spikelets rather crowded. Just appearing in New England, as a weed of railroad yards and roadsides, apparently coming from the West, is a very different plant (no. 2, our FIG. 1): more slender, less geniculate, the culms more ascending, with sheaths little if at all inflated, the nodes less enlarged, the terminal panicles becoming long-exserted

¹ *PANICUM DICHOTOMIFLORUM* Michx., var. **bartowense** (Scribn. & Merr.), comb. nov. *P. bartowense* Scribn. & Merr. in *U. S. Dept. Agric. Div. Agrost. Circ.* xxxv. 3 (1901).

(0.5–2 dm.), their capillary branches all ascending at maturity (not divergent or reflexed) and with fewer and less crowded spikelets; the aspect of the plant being that of *P. capillare* L. As represented in the Gray Herbarium, no. 2 is rare in southern New England and New York; the other specimens are from Pennsylvania, District of Columbia, West Virginia, western Virginia and our recent collection from eastern Virginia (wet argillaceous thickets and ditches, Rosemont, no. 4761), western North and South Carolina, interior Georgia, northern Florida, southern Ontario, Indiana, Kentucky, Tennessee, Illinois, Iowa, Missouri, Arkansas, Louisiana, Kansas, Oklahoma, Texas and California; generally an inland range. No. 1, on the other hand, is the commoner coastwise plant of the East: Nova Scotia, Maine, New Hampshire, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Pennsylvania, Delaware, Maryland, District of Columbia, West Virginia, Virginia, North Carolina, South Carolina, Georgia, Florida, Ohio, Mississippi, Illinois, Iowa, Missouri, Louisiana and Oklahoma. Being weeds, either of them is likely to spread, but the greater abundance of no. 1 in the coastal states is clear.

Panicum dichotomiflorum of Michaux, Fl. Bor.-Am. i. 48 (1803) was no. 2 of this discussion:

DICHOTOMIFLORUM. *P. erectum, glabrum: panicula ramos alternos culmumque terminate, dichotome (absque rachi commune) ramosissima; ramis prolixis, setaceis: floribus oblongis, acuminatis.*

OBS. Habitus fere *P. capillaris*.

HAB. in occidentalibus montium *Alleghanis*.

In 1788, Walter mistook our no. 1 for *Panicum miliaceum* L., the Old World annual:

miliaceum?	7.	Panicula patente, culmo ramoso geniculato decumbente, staminibus flavis, pistillis purpureis,
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the patent panicle and geniculate habit as well as the region (eastern South Carolina) making this apparent. Muhlenberg caught the second character and published the name *P. geniculatum* Muhl. Cat. 8 (1813) as a substitute for *P. dichotomiflorum* Michx., excluding Michaux's habitat and giving only "Pens. . . . Car. Georg." That Muhlenberg probably had our plant no. 1 is evident but nomenclaturally his *P. geniculatum* must rest on *P. dichotomiflorum* (our no. 2). In 1816, Elliott beautifully described as *P. geniculatum* the

common coastwise plant, ascribing the name to Muhl. Cat. but giving a clear interpretation of the synonymy: "*P. dichotomiflorum?* Mich. 1. p. 48. *P. miliaceum*, Walt. p. 72." Elliott's "*culmo asurgenti, geniculato . . . ; paniculis terminalibus, axillaribusque, diffusis, patentibus; vaginis foliorum inflatis*" are unequivocal; but, unfortunately, he called his beautifully characterized plant *P. geniculatum* Muhl., which, as already shown, was a substitute-name for *P. dichotomiflorum*. Delile's *P. retrofractum*, too, the type from Carolina, was the same as the plants of Walter and of Elliott; his "*panicula laxa: ramis retroflexis divaricatis apice floriferis*" makes that clear.

The first varietal name for our no. 1, the plant described by Walter as *Panicum miliaceum*, by Elliott as *P. geniculatum*, and by Delile as *P. retrofractum*, is the name published by Alphonso Wood in 1873: *P. proliferum*,

β. **geniculatum**. Culm thick, geniculate below; pan. dense. Marshes.

Used in this rank, var. *geniculatum* is correct, for it is the first varietal name published for the plant. Wood did not mention Muhlenberg nor Elliott; therefore his name cannot be taken as based upon *Panicum geniculatum*, Muhlenberg's substitute for typical *P. dichotomiflorum*. If Wood had cited Muhlenberg the case would be different and there would then be justification for the assumption of Hitchcock & Chase: "This is probably based on *P. geniculatum* Ell., though that name is not mentioned."¹ When, in 1788, Walter described our plant, he called it *P. "miliaceum?"*, the mark of interrogation indicating that he was doubtfully identifying it with the already published *P. miliaceum* L. In this instance, with no author cited, Hitchcock & Chase made a singular reversal in their reasoning: "Since Walter does not give Linnaeus as authority nor use his diagnosis, this is evidently intended as a new species."² Walter gave no authorities for the species in his *Flora Caroliniana*; but the new species were indicated by italics, the old ones not. Thus, under *Panicum* Walter had the following Linnean names, all properly indicated by typography as not new, though with new diagnoses: *alopecuroideum*, *italicum*, *hirtellum*, *dimidiatum*, *capillare*, *miliaceum?*, *latifolium* and *brevifolium*. Even though Walter misinterpreted the Linnean names in some cases, the fact remains that he was clearly differentiating between the old and the wholly new names.

¹ Hitchc. & Chase, Contr. U. S. Nat. Herb. xv. 49 (1910).

² Hitchc. & Chase, l. c. 48.

Although Hitchcock & Chase cite in the synonymy of their all-inclusive *Panicum dichotomiflorum* some varietal names older than that of Wood, only one might be thought identical with var. *geniculatum*. This is *P. chloroticum* Nees, var. *agreste* Nees in Trin. Gram. Pan. 236 (1826) from Brazil; but the Brazilian material shows that this has the upper leaves more evenly linear nearly to the short tip, var. *geniculatum* having them long-attenuate.

P. PHILADELPHICUM Bernh. PRINCESS ANNE COUNTY: dry argillaceous fields and bushy clearings, Rosemont, *F. & L.*, no. 4760. NANSEMOND COUNTY: sandy wood-road, Factory Hill, *F. & L.*, no. 6472.

Not collected by Kearney or the Grimes's.

P. AMARULUM Hitchcock & Chase. NORTHAMPTON COUNTY: sandy beach of Chesapeake Bay, west of Kiptopeke, *F. L. & F.*, no. 5196.

Not cited by Hitchcock and Chase from the Eastern Shore.

**P. AGROSTOIDES* Spreng. PRINCESS ANNE COUNTY: argillaceous ditches at borders of woods south of Virginia Beach, *F. & L.*, no 4768.

Not recorded by Hitchcock & Chase nor by Hitchcock (Man.) from Virginia. Our material is transitional to the next.

PANICUM AGROSTOIDES* Spreng., var. **ramosius (Mohr), comb. nov. *P. elongatum ramosior* Mohr, Contrib. U. S. Nat. Herb. vi. 357 (1901). PLATE 442, FIGS. 4-6.

The plant (FIGS. 4-6) of bottomlands and alluvium of wooded swamps from Nansemond County at least to Southampton and Greenville Counties, Virginia, scarcely suggests the typical northern *Panicum agrostoides* (FIGS. 1-3). The latter, typified by Hitchcock and Chase by a specimen from Pennsylvania, has the culms strongly compressed, 2-9 dm. high, with pale nodes, the sheaths often longer than the internodes, the blades firm; the terminal panicles 0.8-2.5 dm. long, their branches and branchlets densely floriferous with crowded purple to bronze ellipsoid, acute to short-acuminate spikelets (FIG. 2) 1.7-2.2 mm. long and 0.8-1 mm. in diameter. The fruits are barely stalked (FIG. 3). This plant occurs in typical form from central Maine to western New York and Maryland, more locally to North Carolina and Missouri.

Most of the material from the Mississippi and the adjacent drainages and from the southern and southeastern Coastal Plain is like the plant which we met in the valleys of the Blackwater, Nottoway and Meherrin in southeastern Virginia. In this Coastal Plain-Mississippi Basin plant the culms are less compressed, 0.5-1.5 m. high, with dark

mostly exserted nodes, the leaf-blades membranaceous, the panicles green to drab or lead-color (only when exposed to strong light slightly purple), the terminal ones 1.5–4 dm. long, their branches and branchlets loosely floriferous with green to lead-colored (rarely purple) lanceolate to lance-ovoid attenuate or slender-tipped spikelets (FIGS. 4 and 5) of the same length as in typical *P. agrostoides* but more slender (0.5–0.8 mm.) in diameter. The fruits (FIG. 6) are slightly more slender, approaching those of *P. stipitatum* but even shorter-stiped than in the northern plant. That this is the plant which Mohr had there can be no question. His characterization was perfect:

Stem stouter and taller than in the type, fully 3 feet long, reclining, smooth leaves, 2 feet and over in length, sheaths shorter than the internodes; panicle large, widely spreading, pyramidal, 12 to 18 inches long; lower branches 4 to 5 inches long; secondary branches rather distant, mostly in pairs; spikelets as in the type, pale. By these permanent characters a well marked variety.

That Mohr associated his variety with *P. elongatum* Pursh, not Salisb. (*P. stipitatum* Nash) seems natural. Its slender-tipped and comparatively elongate spikelets, often subsecund along the branchlets, suggest that species; but *P. agrostoides* var. *ramosius* has the barely stipitate fruits and the smooth or smoothish leaf-surfaces of *P. agrostoides*, the quite definite *P. stipitatum* (FIGS. 7–9) having harsh and subrigid leaves, very stiff and contracted panicles with stiffly divergent branchlets of subsecund slender spikelets, and the fruits (FIG. 9) very definitely stipitate.

Hitchcock & Chase were conscious to some degree of *Panicum agrostoides* var. *ramosius* but they did not clearly differentiate it. Their comments in their discussion of *P. agrostoides* apply to it. Referring to some specimens from Georgia, Florida and Texas they said: "In the following specimens the spikelets are more or less secund on the branchlets, giving the panicles much the aspect of those of *P. stipitatum*, . . ."; again, discussing other specimens from Georgia, Florida and Alabama (Mohr's type) they referred to them as "Unusually loosely flowered, open-panicled specimens, such as that named *P. elongatum*, var. *ramosius*."

So different are these plants of the southern Coastal Plain and of the Mississippi Basin from typical northern *Panicum agrostoides* that they seem to me a strongly defined variety. In order to make clear the characters of the plants discussed I have asked Mr. Ogden to display their essential characters in PLATE 442.

The following collections from Virginia belong to *PANICUM AGROSTOIDES*, var. *RAMOSIUS*. GREENSVILLE COUNTY: sandy alluvium, bottomlands of Fontaine Creek, southwest of Haley's Bridge, *F. G. & L.*, no. 6473. SOUTHAMPTON COUNTY: sandy, wooded bottomland of Nottoway River, Courtland, *F. & L.*, no. 6474; sandy alluvium, bordering cypress swamp, bottomland of Nottoway River, above Cypress Bridge, *F. & L.*, no. 5990; sandy alluvium, wooded bottomland of Blackwater River, southeast of Ivor, *F. & L.*, no. 5992. ISLE OF WIGHT COUNTY: sandy alluvium, wooded bottomland of Blackwater River, Zuni, *F. & L.*, no. 5991. NANSEMOND COUNTY: sandy wood-road, Factory Hill, *F. & L.*, no. 6475.

P. ANCEPS Michx., var. *RHIZOMATUM* (Hitche. & Chase) Fern. in *RHODORA*, xxxvi. 73 (1934). NORTHAMPTON COUNTY: dry pine woods near Capeville, *F. L. & F.*, no. 5195.

Extension north from Cape Henry.

P. VILLOSISSIMUM Nash, var. *PSEUDOPUBESCENS* (Nash) Fern. in *RHODORA*, xxxvi. 79 (1934). NANSEMOND COUNTY: dry sandy woods and adjacent clearings, Kilby, *F. L. & F.*, no. 4773. DINWIDDIE COUNTY: border of dry sandy woods near Carson, *F. L. & S.*, no. 5616.

Not recorded by Hitchcock & Chase from the state.

PANICUM* (sub-§ *SCOPARIA*) *mundum***, sp. nov. (TAB. 443, FIGS. 1-5), planta dense cespitosa 0.5-1.4 m. alta; culmis firmis basi 0.7-3 mm. diametro; internodiis elongatis 6-15, imis villosis, villis cinereis adscendenti-patentibus ad 2 mm. longis, internodiis superioribus cinereo-puberulis vel breviter pilosis vel glabris; nodis valde divergenter barbatis; foliis rosulatis basilaribus late lanceolatis firmis glabris 2-4 cm. longis 8-15 mm. latis 45-60-nerviis; foliis caulinis primariis 6-15 anguste lanceolatis firmis glabris 6-15 cm. longis 8-13 mm. latis, basi rotundatis ciliatis ciliis basi bullatis, apice attenuatis, vaginis glabris vel papillato-bullatis margine apiceque ciliatis, ligulis densis ad 1 mm. longis; paniculis primariis deinde exsertis ellipsoideo-ovoideis 7-12 cm. longis 5-10 cm. diametro, rhachi patenter piloso vel glabris, ramibus adscendentibus, pedicellis elongatis glabris; spiculis pubescentibus subgloboso-obovoideis vel -ellipsoideis apice rotundatis vel obtusis 1.8-2.2 mm. longis 1-1.2 mm. diametro, gluma inferiore deltoideo-ovata subacuta 0.4-0.6 mm. longa, superiore lemmateque sterili aequilongis valde costatis fructus lucidos paullo superantibus; statu autumnali sparse ramoso, ramibus adscendentibus, paniculis terminalibus 1-6 cm. longis.—Sussex and Princess Anne Counties, VIRGINIA: (SUSSEX Co.) peaty clearing at border of cypress (*Taxodium*) swamp, 4 miles northwest of Homeville, July 20, 1936, *Fernald & Long*, no. 6017, August 25, 1936, *Fernald & Long*, no. 6499 (TYPE in Gray Herb., ISOTYPES in Herbs. Phil. Acad., Univ. Richmond and elsewhere); (PRINCESS ANNE Co.) sandy and peaty meadows, Rifle Range, south of Rudy Inlet, and peaty meadows south of Dam Neck, June 16, 1935, *Fernald, Griscom & Long*, nos. 4542, 4541 (distributed as *P. nitidum*).

Panicum, subgen. *Dichanthelium*, sub-§ *Scoparia* consists of a few species with tall culms and with numerous nodes and primary leaves. Besides the usually common and widely dispersed *P. scoparium* Lam., it has been recognized as having only three local species: *P. scabriusculum* Ell., one of the very local plants of the Coastal Plain; *P. aculeatum* Hitchc. & Chase, one of the rarest members of the genus; and *P. cryptanthum* Ashe, whose half-dozen or so restricted stations are scattered from Texas to southern New Jersey. It is, therefore, to be expected that other highly localized "relic" species of the sub-section are hidden in favorable habitats on the Coastal Plain.

Panicum mundum is one of the neatest and most definite of species. At once distinguished from the coarser and common *P. scoparium* by its glabrous foliage, small and plump spikelets and sparsely branching habit; it finds its nearest relationship with *P. aculeatum* and *P. cryptanthum*. From them both it is at once distinguished by its copiously pubescent culms (FIG. 3), heavily bearded nodes (FIG. 3) and small round-topped to barely acute, pubescent, obovoid or thick-ellipsoid spikelets (FIG. 5); the other two species having the acute spikelets decidedly more slender and longer, in *P. aculeatum* 3 mm. long and pubescent (FIG. 7), in *P. cryptanthum* 2.2–2.4 mm. long and glabrous (FIG. 6).

The type of *Panicum mundum* comes from an area with many strikingly localized plants. Mr. Long and I had spent some time in a peaty depression where occur many species hitherto unknown or but rarely found in Virginia (*Panicum hemitomon* Schultes, *P. Wrightianum* Scribn., *Leersia hexandra* Swartz, *Rynchospora caduca* Ell., *R. n. sp.* (to be described in a later paper), *Scleria Elliottii* Chapm., *Drosera capillaris* Poir., *Hypericum denticulatum* Walt. var. *ovalifolium* (Britton) Blake, *Sabatia campanulata* (L.) Torr., *Hydrolea quadrivalvis* Walt., etc.). Finally, realizing that our intended destination was far ahead, we were about to start southward, when we noted that, across the road, the boggy area merged into the remnant of a cypress swamp. Anxious to get started, I somewhat impatiently awaited my companion, who had "poked into" the cypress thicket, but he soon returned with the first collection of the astonishing *Panicum*. A month later I personally collected a series of the autumnal state from a different stool of the species.

The two numbers from Princess Anne County (Rifle Range and Dam Neck), both young, greatly puzzled us when they were collected.

In 1935, not feeling competent to propose a new species in *Panicum*, subgen. *Dichanthelium*, I tried to avoid the inevitable by forcing them into the very different *P. nitidum* Lam. Now that another colony, sixty or seventy miles to the west, has been found and the plant collected in full anthesis and in its autumnal state, the essential similarity to it of the coarse plant of Princess Anne is apparent. From *P. nitidum* the new species is strikingly different in its coarser and much taller culms copiously pubescent on the lower internodes (in the slender *P. nitidum* glabrous), in the great number of primary leaves and internodes, in its more pubescent and plumper spikelets, and in its very sparsely and stiffly branched autumnal state, the autumnal state of *P. nitidum* being as densely and intricately branched as in *P. microcarpon* Muhl. or as in *P. dichotomum* L. As in *P. nitidum*, the sheaths of *P. mundum* are often conspicuously viscid-spotted. The great number of primary leaves in the better developed plants and the strong pubescence of *P. mundum* seem to place it in subsection *Scoparia*. In other traits and through the less developed individuals it approaches subsection *Dichotoma*.

In the Princess Anne area, just as in the type-locality, *Panicum mundum* is also a member of a strikingly localized flora. The swales, sands, peats and ponds of Dam Neck and the Rifle Range are essentially confluent. They are the home of usually limited colonies of such plants (rare or local in Virginia) as *Axonopus furcatus* (Flügge) Hitchc., *Eleocharis ambigens* Fern., *Rhynchospora fascicularis* (Michx.) Vahl and *R. Wrightiana* Boeckl., *Juncus Elliottii* Chapm., the endemic *Hypoxis Longii* Fern., the excessively rare *H. sessilis* L., *Viola pectinata* Bickn., *Hydrocotyle Canbyi* C. & R., *Gentiana parvifolia* (Chapm.) Britton., *Asclepias lanceolata* Walt. var. *paupercula* (Michx.) Fern. and *Erigeron vernus* (L.) T. & G.

SACCOLEPIS STRIATA (L.) Nash. PRINCESS ANNE COUNTY: swales back of the dunes, Rifle Range, *F. & L.*, no. 4264; open clay of fields and thickets, Virginia Beach, *F. G. & L.*, no. 4546; fresh to brackish swales along North Landing River, near Creed's, *F. L. & F.*, no. 4775.

Mature culms very brittle.

SETARIA MAGNA Griseb. PRINCESS ANNE COUNTY: border of salt marsh, arm of Lynnhaven Bay at Third Street Bridge, Great Neck, *F. & L.*, no. 4777; fresh to brackish swales along North Landing River, near Creed's, *F. L. & F.*, no. 4778.

At both stations in recently disturbed soil, suggesting recent introduction. Not noted by Kearney.



Photo. E. C. Ogden.

PANICUM AGROSTOIDES: FIG. 1, portion of panicle, $\times 1$; FIG. 2, SPIKELETS, $\times 10$; FIG. 3, fruit, $\times 20$.

P. AGROSTOIDES, var. *RAMOSIUS*: FIG. 4, portion of panicle, $\times 1$; FIG. 5, spikelets, $\times 10$; FIG. 6, fruit, $\times 20$.

P. STIPITATUM: FIG. 7, portion of panicle, $\times 1$; FIG. 8, spikelets, $\times 10$; FIG. 9, fruit, $\times 20$.



Photo. E. C. Ogden.

PANICUM MUNDUM: FIG. 1, plant (TYPE), $\times \frac{2}{5}$; FIG. 2, vernal panicle, $\times 1$; FIG. 3, lower internode, node and base of sheath, $\times 10$; FIG. 4, upper sheath, $\times 10$; FIG. 5, three spikelets, $\times 10$.

P. CRYPTANTHUM: FIG. 6, spikelet, $\times 10$.

P. ACULEATUM: FIG. 7, spikelet, $\times 10$.

**ARTHRAXON HISPIDUS* (Thunb.) Makino, var. *CRYPTANTHERUS* (Hackel) Houda. ELIZABETH CITY COUNTY: roadside ditches bordering peaty depressions in thin woods and bushy clearings west of Hampton, *F. L. & F.*, no. 4758; seen in a similar habitat a few miles farther north.

The eastern range "Pennsylvania to Florida," given by Hitchcock, *Man. Grasses U. S.* 725 (1935), needs clarification. This Asiatic plant is represented in the Gray Herbarium from Pennsylvania only by material from the Japanese Garden in the Centennial Grounds of Philadelphia in 1876. Mr. Long informs me that he knows no evidence of it in Pennsylvania except as *cultivated* in the Japanese Garden of 60 years ago!

ANDROPOGON ELLIOTTII Chapm. ELIZABETH CITY COUNTY: peaty depression in thin woods and bushy clearings, west of Hampton, *F. L. & F.*, no. 4747—not collected by Grimes. NORTHAMPTON COUNTY: frequent to common.

A. VIRGINICUS L., var. *TENUISPATHEUS* (Nash) Fernald & Griscom in *RHODORA*, xxxvii. 142 (1935). Extended north from Princess Anne County to NORTHAMPTON COUNTY: peaty clearing south of Townsend, *F. L. & F.*, no. 5181.

**A. VIRGINICUS*, var. *TENUISPATHEUS*, forma *HIRSUTIOR* (Hackel) Fernald & Griscom, l. c. Extended north from Georgia to NORTHAMPTON COUNTY: moist peaty depressions in pine woods south of Townsend, *F. L. & F.*, no. 5180.

CYPERUS SABULOSUS Mart. & Schrad. Not collected by Grimes. ELIZABETH CITY COUNTY: peaty depressions in thin woods and bushy clearings, west of Hampton, *F. L. & F.*, no. 4809. A frequent weed in NORTHAMPTON COUNTY: Eastville, *F. & L.*, no. 5224.

**C. IRIA* L. As pointed out by Fernald & Griscom in *RHODORA*, xxxvii. 147, 148 (1935), the common form of *C. Iria* in southeastern Virginia is var. *Santonici* (Rottb.) Fern. & Grisc. We now have true *C. Iria* from PRINCESS ANNE COUNTY: clearing in rich dry woods, Little Neck, *F. & L.*, no. 4810.

**C. ENGELMANNI* Steud. NORTHAMPTON COUNTY: sandy border of pond in woods back of the dunes, Savage Neck, *F. L. & F.*, no. 5228.

The first record, apparently, of the species in the coastwise Atlantic States from south of Massachusetts and New York, where it is local and isolated from the Mississippi drainage. The pond where *Cyperus Engelmanni* abounds is one of a group of small ponds with two other extraordinarily local species abounding. See notes on *Wolffia punctata* and *Wolffella floridana*.

**ELEOCHARIS PROLIFERA* Torr. PRINCESS ANNE COUNTY: forming

continuous turf at the peaty margin of a cove, southern end of Lake Joyce, *F. L. & F.*, no. 4817.

Cited, with doubt, by Kearney from sterile material collected at Cape Henry. The plant seen by us (*F. & L.*, no. 3761) in fruit at Cape Henry was *E. microcarpa* Torr.

**E. FLACCIDA* (Reichenb.) Urban, var. *OLIVACEA* (Torr.) Fern. & Grisc. in *RHODORA*, xxxvii. 155 (1935). NORTHAMPTON COUNTY: boggy swale bordering swampy woods south of Kendall Grove, *F. L. & F.*, no. 5235. ISLE OF WIGHT COUNTY: moist depressions in sandy pine barrens south of Zuni, *F. & L.*, no. 6532.

Extension south from New Jersey.

FUIRENA HISPIDA Ell. NANSEMOND COUNTY: springy and sandy depressions, Kilby, *F. L. & F.*, no. 4822. Thence frequent west to the Fall Line.

Not listed by Kearney, who notes *F. squarrosa* Michx., a species common in Princess Anne County and on the Eastern Shore but not seen by us to the westward.

RYNCHOSPORA CORNICULATA (Lam.) Gray. YORK COUNTY: filling a small depression or "bay," about four miles south of Yorktown.

Examined but not taken, since we did not realize that it is not in Grimes's collection. Occasional in the most southern counties, from Princess Anne westward.

R. CYMOSA Ell. ELIZABETH CITY COUNTY: peaty depressions in thin woods and bushy clearings west of Hampton, *F. L. & F.*, no. 4827; common in the southern counties from Princess Anne to the Fall Line.

Not collected by Grimes.

R. MICROCEPHALA Britton. See Fernald, *RHODORA*, xxxvii. 404, 405, t. 391, figs. 4 and 5 (1935). PRINCESS ANNE COUNTY: fresh to brackish swale along North Landing River, near Creed's, *F. L. & F.*, no. 4830.

Recorded only from Norfolk County, but frequent westward to the Fall Line.

R. INEXPANSA (Michx.) Vahl. NORTHAMPTON COUNTY: moist peaty depression in pine woods south of Townsend, *F. L. & F.*, no. 5246.

Extension north from Princess Anne County, where it is common, thence west to the Fall Line.

CLADIUM JAMAICENSE Crantz. To the few recorded stations add PRINCESS ANNE COUNTY: fresh to brackish swales along North Landing River, near Creed's, *F. L. & F.*, no. 4832.

The three recorded stations (Kearney's at Northwest, Fernald & Long's near Blackwater River, tributary to North Landing River (see RHODORA, xxxvii. 405) and this station near Creed's) are on the estuaries of small rivers entering the northwest head of Curratuck Sound.

SCLERIA TRIGLOMERATA AND ITS ALLIES (PLATE 444).—In southeastern Virginia the plants with cellular-reticulate 3-angled hypogynium, no tubercles, and lustrous, smooth, white, cream-colored, drab or marbled achenes, occur as three clearly defined species, all of which are reduced outright in Core's treatment¹ to *Scleria triglomerata*. The three occur in close proximity to one another, two of them often closely intermingled in the same habitats. Consequently, if they are mere phases of one species, it is singular that they should be so sharply distinguished by clear morphological characters, without intergrading in the same habitats. Study of the series in the Gray Herbarium shows that the three have several definite characters each and that their broad ranges are quite different, although in the Coastal Plain from New Jersey to North Carolina they all come together.

Without a very critical examination of the type of *Scleria triglomerata* Michx. Fl. Bor.-Am. ii. 168 (1803) it is impossible to say which of the three he had. Upon examining it many years ago Asa Gray made the pencilled memorandum regarding the material: "Very poor." Consequently, its exact identity can presumably be made out only by one very intimately acquainted with minute details of the plants. For the time being I am retaining the name *S. triglomerata* for the coarsest of the three plants (FIGS. 1-4), the species of wide range to which the name has been most generally applied since the monograph of Torrey. *S. nitida* Willd. in Kunth, Enum. ii. 350 (1837), with emphasis given the "rigid" slender leaves and the OVATE-subglobose achenes, is taken up for a Coastal Plain species with these characters. In 1855 Steudel, Syn. Pl. Cyp. 174, described from South Carolina a *S. flaccida*. From his diagnosis alone it might be either of the two above noted. The third species is the excessively slender *S. minor* (Britton) Stone, Rep. N. J. State Mus. for 1910: 283 (1911).

As I understand these three species, they are distinguished as follows.

¹ E. L. Core, Am. Sp. Scleria, Brittonia, ii. 63 (1936).

- a. Membranous band on ventral side of leaf-sheath glabrous or nearly so below the sharply separated glabrous to puberulent ligule; rhizome forking, in no. 1 forming a knotty mass. Plant pale- or yellow-green; culms 2.5-6 mm. thick at base; leaves 5-8 mm. broad, linear and scarcely narrowed up to the short tip, glabrous or the sheaths and midribs beneath pilose; achenes subglobose to oblate, strongly rounded at summit, nearly or quite as broad as long, 2-2.5 mm. high, 2-2.7 mm. broad (FIGS. 1-4)..... 1. *S. triglomerata*.
 Plant bluer-green; culms 1-2 mm. thick at base; leaves 1-2.5 mm. broad, attenuate to long slender tips, glabrous or merely scabrous; achenes subglobose to ovoid, 1-1.8 mm. high, 1.2-1.8 mm. broad (FIGS 5-8)..... 2. *S. minor*.
- a. Membranous band puberulent or tomentulose, not sharply differentiated from the puberulent or tomentulose ligule; rhizome usually simple and elongate; plant blue-green, with linear-attenuate leaves 2-6 (rarely -8) mm. broad, puberulent to glabrous, scarcely pilose; achenes ovoid or ovoid-subglobose, longer than thick, (2-)2.8-3.3 mm. long, 2-2.8 mm. broad (FIGS. 9-12)..... 3. *S. nitida*.

1. *S. TRIGLOMERATA* Michx. Fl. Bor.-Am. ii. 168 (1803), at least in sense of Torrey, Ann. Lyc. N. Y. iii. 372 (1836) and most later authors.—Eastern Massachusetts to southern Ontario, Wisconsin and Iowa, south to Florida, Alabama, Mississippi, Louisiana and Texas.—Common in southeastern Virginia, especially west of the Dismal Swamp. PLATE 444, FIGS. 1-4.

2. **S. MINOR* (Britton) W. Stone, Rep. N. J. State Mus. for 1910: 283 (1911). *S. triglomerata*, var. *gracilis* Britton, Ann. N. Y. Acad. Sci. iii. 230 (1885), not *S. gracilis* Ell. (1824). *S. triglomerata*, var. *minor* Britton in Britton & Brown, Ill. Fl. i. 282 (1896).—Southern New Jersey to North Carolina.—In Virginia frequent to common in peaty or boggy depressions at least of Henrico and Prince George Counties. HENRICO COUNTY: exsiccated swale near Byrd Airport, *F. L. & S.*, no. 5666. PRINCE GEORGE COUNTY: argillaceous and siliceous boggy depressions, about 3 miles southeast of Petersburg, at head of Poo Run, *F. L. & S.*, no. 5665; argillaceous and boggy depression north of Gary Church, *F. L. & S.*, no. 5667. FIGS. 5-8.

3. *S. NITIDA* Willd. in Kunth, Enum. ii. 350 (1837), ex char.—New Jersey to Florida, thence to Mississippi, chiefly in dry sandy woods and thickets.—The Virginia material in the Gray Herbarium is as follows. PRINCESS ANNE COUNTY: dry oak woods, Cape Henry, *F. & G.*, no. 2771 (as *S. triglomerata*, var. *gracilis*). NANSEMOND COUNTY: dry sandy woods and adjacent clearings, Kilby, *F. L. & F.*, no. 4833 (as *S. triglomerata*). ISLE OF WIGHT COUNTY: dry sandy pine and oak woods about 1 mile southeast of Zuni, *F. & L.*, no. 6094; dry sandy pine barrens south of Zuni, *F. G. & L.*, no. 6549; dry sandy yellow pine and oak woods near Walters, *F. & L.*, no. 6095. JAMES CITY COUNTY: sandy soil in thicket, 2½ miles west of Williamsburg, *Grimes*, no. 3843 (as *S. triglomerata*). BEDFORD COUNTY: July 1, 1871, *A. H. Curtiss*. FIGS. 9-12.



Photo. E. C. Ogden.

SCLERIA TRIGLOMERATA: FIG. 1, inflorescence, $\times 1$; FIG. 2, summit of leaf-sheath, $\times 10$; FIG. 3, rhizome, $\times 1$; FIG. 4, nutlets, $\times 5$.

S. MINOR: FIG. 5, inflorescence, $\times 1$; FIG. 6, summit of sheath, $\times 10$; FIG. 7, rhizome, $\times 1$; FIG. 8, nutlets, $\times 5$.

S. NITIDA: FIG. 9, inflorescence, $\times 1$; FIG. 10, summit of sheath, $\times 10$; FIG. 11, rhizome, $\times 1$; FIG. 12, nutlets, $\times 5$.



Photo. E. C. Ogden.

JUNCUS GRISCOMI: FIG. 1, plant (TYPE), $\times \frac{2}{5}$; FIG. 2, portion of inflorescence, $\times 1$; FIG. 3, fruit, $\times 6$; FIG. 4, seeds, $\times 20$.

J. EFFUSUS, var. *COSTULATUS*: FIG. 5, fruits, $\times 6$.

J. GYMNOCARPUS: FIG. 6, fruit, $\times 6$.

S. SETACEA Poir. NORTHAMPTON COUNTY: boggy swale bordering swampy woods south of Kendall Grove, *F. L. & F.*, no. 5247.

Not recorded from Virginia by Core, *Am. Sp. Scleria*, Brittonia, ii. no. 1 (1936); noted from Princess Anne County in RHODORA, xxxvii. 405 (1935).

CAREX ARENARIA L. NORTHAMPTON COUNTY: sandy woods among the dunes, Savage Neck, *F. & L.*, no. 5249; crest of sandy and argillaceous bluff, Chesapeake Bay, west of Kiptopeke, *F. L. & F.*, no. 5250.

Appearing in every way like an indigenous element of the vegetation; seeming to us like a relic on our coast comparable with the many limited colonies from New England to Newfoundland of species which abound in western Europe. Our experience does not support the statement of the late K. K. Mackenzie in the North American Flora, xiii. 39 (1931): "adventive from Europe. . . . Scarcely well enough established to be treated as a member of the North American flora."

C. STIPATA Muhl., var. UBERIOR Mohr (*C. uberior* (Mohr) Mackenz.). Common in swampy woods of NORFOLK and PRINCESS ANNE COUNTIES: east of Little Creek, *F. & G.*, no. 4322.

Presumably the plant intended by Kearney's citation of *C. stipata*.

C. LAEVIVAGINATA (Kükenth.) Mackenz. PRINCESS ANNE COUNTY: swampy woods east of Little Creek, *F. & G.*, no. 4320.

C. SEORSA E. C. Howe. PRINCESS ANNE COUNTY: swamp east of Little Creek, *F. & G.*, no. 4316.

C. HOWEI Mackenz. PRINCESS ANNE COUNTY: wet swale east of Little Creek, *F. & G.*, no. 4315.

*C. FLACCOSPERMA Dew. NORFOLK COUNTY: gum swamp near Cornland, *F. & G.*, no. 4343.

Extension north from North Carolina.

*C. STRICTA Lam. PRINCESS ANNE COUNTY: by creek in gum swamp, west of Pungo, *F. & G.*, no. 4323.

Not seen from Virginia by Mackenzie in preparing the treatment of *Carex* for the North American Flora.

*C. FOLLICULATA L., var. AUSTRALIS Bailey (*C. lonchocarpa* Willd., *C. Smalliana* Mackenz.) NORFOLK COUNTY: alluvial woods near Cornland, *F. & G.*, no. 4347. Frequent in bottomlands and swamps westward to the Fall Line.

Not seen from north of South Carolina by Mackenzie in preparing the treatment of *Carex* for the North American Flora.

*C. RIPARIA Curtis, var. LACUSTRIS (Willd.) Kükenth. (*C. lacustris*

Willd.). PRINCESS ANNE COUNTY: by creek in gum swamp, west of Pungo, *F. & G.*, no. 4346.

Not seen from south of Delaware and the District of Columbia by Mackenzie in preparing the treatment of *Carex* for the North American Flora.

I am not able to follow Mackenzie in specifically separating the North American *Carex lacustris* from the Old World *C. riparia*. I find myself more in accord with Francis Boott, William Boott, Bailey and Kükenthal in treating it as one of the variations of a semi-cosmopolitan species. Mackenzie's differentiation of the American *C. lacustris* and *C. hyalinopsis* Steud. (*C. riparia*, var. *impressa* S. H. Wright) as species apart from *C. riparia* is not clarified by his characterization (p. 436) of the American *C. lacustris* as having "staminate . . . scales oblong-obovate, obtuse, retuse or emarginate, mucronate," followed on the next page by the explanation, that "In *Carex lacustris*, . . . the staminate scales are cuspidate or awned, while in the other two species they are retuse and mucronate."

**WOLFFIELLA FLORIDANA* (J. D. Sm.) Thompson. Apparently common in quiet waters of ponds and pools, PRINCESS ANNE COUNTY: creek between the ponds, Dam Neck, *F. & G.*, no. 4352; Rainey's Pond, *F. G. & L.*, no. 4601; Lake Joyce, *F. G. & L.*, no. 4600. NORTHAMPTON COUNTY: forming dense stranded carpets at borders of small ponds in woods back of the dunes, Savage Neck, *F. L. & F.*, no. 5252, in one pond making a continuous band outside the equally continuous inner zone of *Wolffia punctata*. SURRY COUNTY: abundant in the pond, Sunken Meadow Beach, *F. & L.*, no. 6789.

**WOLFFIA PUNCTATA* Griseb. A species of southern and inland range, occurring from the West Indies and Florida to Texas, north in the interior to northwestern New York (Irondequoit Bay), southern Ontario and southern Michigan. NORTHAMPTON COUNTY: floating in greatest profusion in a small pond in woods back of the dunes, Savage Neck, inclosed by a broad marginal zone of *Wolffiella floridana*. SURRY COUNTY: abundant in the pond, Sunken Meadow Beach, *F. & L.*, no. 6788.

First stations in the coastwise region north of Florida. See note under *Cyperus Engelmanni*.

TILLANDSIA USNEOIDES L. Frequent in the southeastern counties, reaching its northern limit, apparently, in NORTHAMPTON COUNTY: abundant on many species of deciduous trees, Eastville, *F. & L.*, no. 5256.

**EICHORNIA CRASSIPES* (Mart.) Solms. PRINCESS ANNE COUNTY: in water of cove, southern end of Lake Joyce, *F. L. & F.*, no. 4842.

It is to be hoped that this, the Water Hyacinth, will not spread, as it does in the Gulf States, and thus obliterate *Limnolobium* and other rare species of Lake Joyce.

JUNCUS (§ GENUINI) **Griscomi**, sp. nov. (TAB. 445, FIGS. 1-4), planta dense cespitosa habitu *J. effuso* var. *costulato* simillima; caulis erectis teretibus mollibus laete viridibus medulla continua repletis circa 1 m. altis basi 2-3 mm. diametro; cataphyllis arcte vaginatis fulvescentibus membranaceis opacis, supremis 9-11 cm. longis apice rotundatis subuliferis subulo 3-4 mm. longo; inflorescentiis anthelatis laxis regulariter brachiatis 3-8 cm. latis floribus remotis; bracteis infimis teretibus erectis 0.8-2 dm. longis; prophyllis chartaceis pallidis lanceolato-ovatis apice attenuato-subulatis; floribus 3-3.6 mm. longis; sepalis (tepals externis) firmis viridescentibus lanceolato-attenuatis apice subulatis valde costatis margine anguste hyalinis 0.4-0.6 mm. latis; petalis (tepals internis) simillimis subbrevioribus; staminibus 3 sepalis $\frac{1}{3}$ brevioribus; antheris linearibus filamentis paullo longioribus, filamentis apice rufescentibus; capsulis perianthia subaequantibus trigono-oblongis olivaceis nitidis subcoriaceis tricoccis apice rotundato-truncatis valde mucronatis, rostro mucroniformi firmo 0.3-0.5 mm. longo; seminibus 0.6 mm. longis aureo-brunneis inaequaliter ellipsoideis breviter apiculatis, apiculis purpurascens, obscure transversim reticulatis.—Princess Anne County, VIRGINIA: about a spring in woods, Little Neck, June 17, 1935, *Fernald, Griscom & Long*, no. 5604 (TYPE in Gray Herb.; ISOTYPES in Herbs. Phil. Acad., Griscom, and elsewhere).

Juncus Griscomi, although superficially suggesting *J. effusus* L., var. *costulatus* Fernald, at once attracted us by its greener color and more open inflorescences and especially by the strong and prominent beaks of the capsules. In *J. effusus* (including its varieties) the capsule (FIG. 5) is emarginate or depressed at tip and beakless. In having a definitely beaked capsule *J. Griscomi* suggests the very localized relic, *J. gymnocarpus* Coville (*J. Smithii* Engelm. (1868), not Kunth (1841)), a species known only locally on the Appalachian plateaus of Pennsylvania and Tennessee, with a Coastal Plain area in northwestern Florida. But *J. Griscomi* is not very closely related to *J. gymnocarpus*, which has elongate rhizomes and a hard, usually indehiscent, ovoid to spherical capsule (FIG. 6) much longer than the short perianth, and 6 stamens.

In having a beaked or mucronate capsule *Juncus Griscomi* also suggests *J. inflexus* L. (*J. glaucus* Ehrh.), an Old World species somewhat naturalized in North America, but *J. inflexus* is much more slender and glaucous, with stricter inflorescences, smaller and more

fuscous flowers, 6 stamens and more tapering castaneous capsules. The affinity of *J. Griscomi* is, clearly, with *J. effusus*, but its strongly mucronate capsules at once separate it from all forms of that aggregate species. As yet we know it only from the type-station, an extensive springy depression where the localized *Juncus* abounds.

J. ROEMERIANUS Scheele. Common in Princess Anne County, this species extends north at least to NORTHAMPTON COUNTY: border of salt marsh, Old Town Neck, *F. L. & F.*, no. 5260.

Small (Man.) states its northern limit as North Carolina; already recorded by Erlanson from the James River.

J. REPENS Michx. NORTHAMPTON COUNTY: moist dune-hollows, Savage Neck, *F. L. & F.*, no. 5267. In the Gray Herbarium an old specimen from NANSEMOND COUNTY: Suffolk, October 26, 1831, *Wm. Darlington*. Frequent westward to Southampton, Sussex and Prince George Counties.

NOTHOSCORDUM BIVALVE (L.) Britton. Recorded from Princess Anne County by Kearney; not listed by Grimes or Erlanson. The following specimens in the Gray Herbarium indicate northward extensions. ELIZABETH CITY COUNTY: Fortress Monroe, May, 1877, *Thos. Morong*; Hampton, May 4, 1894, *J. R. Churchill*; boggy meadow near sea, Buckroe, *B. L. Robinson*, no. 354. NORTHAMPTON COUNTY: upper border of salt marsh near Kiptopeke, *F. L. & F.*, no. 5268.

**HYPOXIS MICRANTHA* Pollard. NANSEMOND COUNTY: dry sandy woods and adjacent clearings, Kilby, *F. L. & F.*, no. 4847. PRINCE GEORGE COUNTY: dry sandy pine woods about 3 miles southeast of Petersburg, on headwaters of Blackwater River, *F. L. & S.*, no. 5733. Previously collected in FAIRFAX COUNTY: moist gravelly soil, hillside thicket north of Occoquan, *L. F. & F. R. Randolph* (distributed as *H. hirsuta*).

The first records from north of North Carolina.

IRIS VIRGINICA L. Common in swamps and along streams from Princess Anne County westward to the Fall Line; many collections.

**LISTERA AUSTRALIS* Lindl. PRINCESS ANNE COUNTY: rich pine woods, Creed's, *F. & G.*, no. 4373; rich pine woods, Munden, *F. & G.*, no. 4374.

Not recorded by Wiegand, Bull. Torr. Bot. Cl. xxvi. 165 (1899) from the state.

**MALAXIS Bayardi*. sp. nov. (FIG.-TEXT. 1 et TAB. 446, FIGS. 1 et 2), planta habitu *M. unifoliar* simillima 1.2-2.5 dm. alta; corno 1-1.5 cm. diametro; vaginis basilaribus 2, imis perbrevibus chartaceis apice subtruncatis, superioribus herbaceis 1-2.5 cm. longis apice obliquis; folia laminifera vagina 4-8 cm. longa, lamina elliptica 2.3-5.5 cm. longa 1.2-2.5 cm. lata; pedunculo 3-7 cm. alto; racemo in anthesi lineari-

cylindrico 5–12 cm. longo 5–10 mm. diametro; bracteis ovatis 1–1.5 mm. longis basi decurrentibus; pedicellis adscendentibus 2–4.5 mm. longis; floribus numerosis viridescentibus 2.5–3.5 mm. longis; sepalis lateralibus ovato-lanceolatis obliquis obtusis 1.2–1.7 mm. longis, sepalo medio lineari-oblongo circa 2 mm. longo; petalis linearibus quam sepala media brevioribus; labio late cordato-deltaideo 2.5 mm. longo 2.2–2.5 mm. lato lobis basalaribus subdivergentibus 1–1.4 mm. longis, lobis terminalibus lateralibus deltaeideis 0.4–0.6 mm. longis, lobo medio 0.2–0.3 mm. longo.—VIRGINIA: dry sandy woods and adjacent clearings, Kilby, Nansemond County, September 11, 1935, *M. L. Fernald, Bayard Long & John M. Fogg, Jr.*, no. 4851 (TYPE in Gray Herb.; ISOTYPES in Herbs. Phil. Acad. and Univ. Penn.). NORTH CAROLINA: Blowing Rock, Watauga County, August 5, 1893, *B. L. Robinson*, no. 97 in part (mixed with and distributed as *Microstylis ophioglossoides* Nutt.).



FIG. 1. FLOWER OF *MALAXIS BAYARDI*, laid open, $\times 10$.

Malaxis Bayardi (for its discoverer, BAYARD LONG) is a highly localized plant, but is presumably of broader range through the southeastern states than the two collections at hand would indicate. The sheet from Blowing Rock, in the Blue Ridge of northwestern North Carolina, contains 2 plants of *M. unifolia* Michx. (*Microstylis ophioglossoides* Nutt.) and two of the newly described species, mixed and apparently not differentiated by Dr. Robinson in collecting them. At the type-locality, Kilby, *M. Bayardi* was found under the thicket bordering pine (*Pinus echinata*) and oak woods in the Coastal Plain of southeastern Virginia.

Long, Fogg and I, venturing westward from our centre in Princess Anne County, found northern Nansemond County occupied largely by a different flora (see p. 378). With very limited time at our disposal, we were collecting small series of each interesting plant. Long, reaching under the overhanging shrubs, collected a specimen of the strange *Malaxis* and called our attention to it. My own enthusiasm to help was promptly diminished through an attack by ants upon my bare arms; but Long and Fogg between them secured sufficient specimens for a good type-series.

The nearest relatives of *Malaxis Bayardi* are the common North American *M. unifolia* Michx. (FIG. 3 and TEXT-FIG. no. 2) and *M. Grisebachiana* Fawc. & Rendle, of the West Indies. Both of the latter species have thick- or oblong-cylindric spikes. That of *M.*

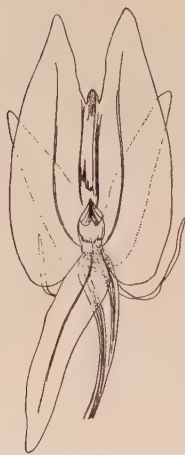


FIG. 2. FLOWER OF *MALAXIS UNIFOLIA*, laid open, $\times 10$.

unifolia, when fully expanded, 1–10 cm. long and 1.3–2.5 cm. thick, with mature divergent pedicels 4–8 mm. long. In *M. unifolia* the larger flowers (FIG. 3 and TEXT-FIG. 2) have the oblong-oval lip shallowly cordate at base, with the 2 lateral apical lobes elongate, the central one a tiny tooth. The West Indian *M. Grisebachiana*, as shown by the illustrations (Fawcett & Rendle, Fl. Jam. i. t. 6, figs. 18–23) and by the West Indian specimens, has a short and thick raceme like that of *M. unifolia*, but an almost quadrate short-oblong lip only 1.75 mm. broad and with comparatively short basal lobes.

In its very slender raceme *Malaxis Bayardi* suggests the calcicolous boreal *M. brachypoda* (Gray) Fern. in RHODORA, xxviii. 176 (1926) and xxxv. 241, t. 253, figs. 1–4 (1933); but *M. brachypoda* has the leaf nearly basal, yellowish and larger flowers, narrower bracts, and drooping cordate lip with prolonged entire tip.

(To be continued)

NEW NAMES AND NEW COMBINATIONS FOR TEXAS PLANTS

V. L. CORY

PRIOR to the publication of a check list of the plants of Texas by the Texas Agricultural Experiment Station to take place at an early date, it is found desirable to publish the new names and the new combinations that will be used in that list. In general these changes are needed to bring the nomenclature up to date and in harmony with the International Rules and conservative usage.

NEW NAMES

DESCURAINIA multifoliata, nom. nov. *Sophia millefolia* Rydb. ex Britton, Man. ed. 2, 462. 1905. Not *D. millefolia* (Ait.) Webb. & Berth. 1836.

CASSIA Fisheri, nom. nov. *Chamaecrista rostrata* Woot. & Standl. Contr. U. S. Nat. Herb. 16: 135. 1913. Not *Cassia rostrata* Voigt, 1928. Named for its collector, my friend, Geo. L. Fisher.

ASTRAGALUS **Microphacos**, nom. nov. *Dalea parviflora* Pursh, Fl. Amer. Sept. 474. 1814. *A. parviflorus* MacMill., 1892, not *A. parviflorus* Lam., 1783. *A. gracilis* A. Gray, 1864, not *A. gracilis* Nutt., 1818. *Microphacos parviflorus* Rydb., 1913.

PSORALEA **Rydbergii**, nom. nov. *Pediomelum humile* Rydb., N. A. Fl., 24: 24. 1919. Not *P. humilis* Mill., Gard. Dict. ed. 8. *Psoralea* no. 7, 1768.

OXALIS **oreophila**, nom. nov. *Ionoxalis monticola* Small, N. A. Fl. 25: 42. 1907. Not *O. monticola* Arech., Anal. Mus. Nac. Montevideo, 3: 231. 1900. Fl. Uruguay, 1: 231. 1900.

MAMMILLARIA **Engelmannii**, nom. nov. *Echinocactus Muchlenpfordtii* Poselg., Allg. Gartenz. 21: 102. 1853. Not *M. Muchlenpfordtii* Foerst, ex Otto & Dietr., Allg. Gartenz. 15: 49. 1847. *M. Scheeri* Muehlenpf., var. *valida* Engelm., Proc. Amer. Acad. 3: 265. 1856. Not *M. valida* Webber, Dict. Hort. Bois. 806. 1898.

MAMMILLARIA **Escobaria**, nom. nov. *Escobaria Runyonii* Britton & Rose, Cactaceae 4: 55. 1923.

HEDEOMA **texana**, nom. nov. *Hedeoma ciliata* Benth. ex DC. Prod. 12: 245. Nov., 1848. Not *H. ciliata* Nutt., Journ. Acad. Phila. II. 1: 183. Aug., 1848. *Stachydeoma ciliata* Small.

NEW COMBINATIONS

BOUTELOUA **HIRSUTA** Lag., var. **pectinata** (Featherly), comb. nov. *B. pectinata* Featherly, Bot. Gaz., 91: 103. 1931.

CAMASSIA **scillioides** (Raf.), comb. nov. *Cyanotris scillioides* Raf., Am. Month. Mag. 3: 356. 1818. *Lamotris hyacinthina* Raf., 1836. *Quamassia hyacinthina* Britton.

JUNCUS **TENUIS** Willd., var. **platyphyllus** (Wiegand), comb. nov. *J. dichotomus* Ell., var. *platyphyllus* Wiegand, Bull. Torr. Bot. Club, 30: 448. 1903.

AGAVE **tigrina** (Engelm.), comb. nov. *A. virginica* L., var. *tigrina* Engelm., Trans. Acad. Sci. St. Louis, 3: 302. 1875.

SPIRANTHES **floridana** (Wherry), comb. nov. *Ibidium floridanum* Wherry, Jour. Wash. Acad. Sci. 21: 49, fig. 1. 1931.

SPIRANTHES **Reverchonii** (Small), comb. nov. *Gyrostachys Reverchonii* Small, Bull. Torr. Bot. Club, 25: 610. 1898.

QUERCUS **stellipila** (Sarg.) Parks,¹ comb. nov. *Q. texana* Buckl., var. *stellipila* Sarg., Bot. Gaz. 65: 424. 1918.

TIDESTROMIA **LANUGINOSA** (Nutt.) Standl., var. **carnosa** (Steyermark), comb. nov. *Cladothrix lanuginosa* Nutt., var. *carnosa* Steyermark, Ann. Mo. Bot. Gard. 19: 389. 1932.

MIRABILIS **JALAPA** L., var. **Lindheimeri** (Standl.), comb. nov. *M. Jalapa* L., subsp. *Lindheimeri* Standl., Contr. U. S. Nat. Herb. 12: 368. 1909.

¹ Mr. H. B. Parks, Chief, Division of Apiculture, Texas Agr. Expt. Station, who is completing his study of the oaks of Texas.

NYPHAEAE **lekophylla** (Small), comb. nov. *Castalia lekophylla* Small, Man. Southeastern Fl. 543. 1933.

DESCURAINIA **andrenarum** (Cockerell), comb. nov. *Sophia andrenarum* Cockerell, Bull. Torr. Bot. Club, **24**: 48. 1901.

ROIPPA OBTUSA (Nutt.) Britton, var. **sphaerocarpa** (A. Gray), comb. nov. *Nasturtium sphaerocarpum* A. Gray, Mem. Amer. Acad., **4**: 6. 1849.

STREPTANTHUS **validus** (Greene), comb. nov. *Disaccanthus validus* Greene, Leaflets **1**: 225. 1906.

ACACIA **densiflora** (Alexander), comb. nov. *Vachellia densiflora* Alexander ex Small, Man. Southeastern Fl. 665. 1933.

CASSIA **littoralis** (Pollard), comb. nov. *Chamaecrista littoralis* Pollard, Proc. Biol. Soc. Wash. **15**: 20. 1902.

PSORALEA **caudata** (Rydb.), comb. nov. *Pedimelum caudatum* Rydb., N. A. Fl. **24**: 19. 1919.

PSORALEA **psoralioides** (Walt.), comb. nov. *Trifolium psoralioides* Walt., Fl. Carol. 184. 1788. *Hedysarum pedunculatum* Mill., Gard. Dict., ed. 8. Hedysarum No. 17. 1768. *P. pedunculata* Vail, 1894, not *P. pedunculata* Poir., 1816.

DALEA **laxa** (Rydb.), comb. nov. *Parosela laxa* Rydb., N. A. Fl. **24**: 85. 1920.

DALEA **longipila** (B. L. Robinson ex Rydb.), comb. nov. *D. mollis* Benth., var. *longipila* B. L. Robinson ex Rydb. N. Am. Fl. **24**: 64. 1919 (in synonym.). *Parosela longipila* Rydb., l. c. 1919.

DALEA **neomexicana** (A. Gray), comb. nov. *D. mollis* Benth. (?), var. *neomexicana* A. Gray, Pl. Wright. **1**: 47. 1852. *Parosela neomexicana* Heller, Cat. Pl. N. Am. ed. 2, 6. 1900.

TEPHROSIA **leucosericea** (Rydb.), comb. nov. *Cracca leucosericea* Rydb., N. A. Fl. **24**: 163. 1923.

TEPHROSIA **texana** (Rydb.), comb. nov. *Cracca texana* Rydb., N. A. Fl. **24**: 176. 1923.

SESBANIA **Drummondii** (Rydb.), comb. nov. *Daubentonia Drummondii* Rydb., Am. Journ. Bot., **10**: 498. 1923. *Daubentonia longifolia* of authors; in part of DC., as to description.

SESBANIA **exaltata** (Raf.), comb. nov. *Darwinia exaltata* Raf., Fl. Ludov. 106. 1817. *Sesban exaltatus* Rydb., 1924.

ASTRAGALUS **Emoryanus** (Rydb.), comb. nov. *Hamosa Emoryana* Rydb., Bull. Torr. Bot. Club, **54**: 327. 1927.

ASTRAGALUS **leptocarpoides** (M. E. Jones), comb. nov. *A. Nuttallianus* DC., var. *leptocarpoides* M. E. Jones, Contr. W. Bot. **8**: 22. 1898. *Hamosa leptocarpoides* Rydb., 1927.

ASTRAGALUS **macilentus** (Small), comb. nov. *Hamosa macilenta* Small, Fl. Se. U. S. 618, 1332. 1903.

ASTRAGALUS **Tracyi** (Rydb.), comb. nov. *Phaca Tracyi* Rydb., N. A. Fl. **24**: 351. 1929.

EUPHORBIA **Ingallsii** (Small), comb. nov. *Chamaesyce Ingallsii* Small, Fl. Se. U. S. 708, 1333. 1903.

EUPHORBIA **Stanfieldii** (Small), comb. nov. *Chamaesyce Stanfieldii* Small, Fl. Se. U. S. 712, 1333. 1903.

RHAMNUS PURSHIANA DC., var. **betulaefolia** (Greene), comb. nov. *R. betulaefolia* Greene, Pittonia 3: 16. 1929.

SIDA **sagittaeifolia** (A. Gray), comb. nov. *S. lepidota* A. Gray, var. *sagittaeifolia* A. Gray, Pl. Wright. 1: 18. 1852. *Disella sagittaeifolia* Greene, 1906.

MAMMILLARIA **Runyonii** (Britton & Rose), comb. nov. *Coryphantha Runyonii* Britton & Rose, Cactaceae 4: 26. 1923.

MAMMILLARIA **Sneedii** (Britton & Rose), comb. nov. *Escobaria Sneedii* Britton & Rose, Cactaceae 4: 56. 1923.

HEIMIA **longipes** (A. Gray), comb. nov. *Nesaca longipes* A. Gray, Pl. Wright. 1: 68. 1852.

VACCINIUM **Langloisii** (Greene), comb. nov. *Polycodium Langloisii* Greene, Leaf. Bot. Obs. & Crit. 2: 226. 1912.

SALVIASTRUM TEXANUM Scheele, var. **canescens** (A. Gray), comb. nov. *Salvia texana* (Scheele) Torr., var. *canescens* A. Gray, Proc. Am. Acad. 8: 368. 1872.

MONARDA PUNCTATA L., var. **Stanfieldii** (Small), comb. nov. *M. Stanfieldii* Small, Fl. Se. U. S., 1038. 1903.

AGASTACHE **pallida** (Lindl.), comb. nov. *Cedronella pallida* Lindl., Bot. Reg. t. 29. 1846.

PENSTEMON TRIFLORUS Heller, var. **integrifolius** (Pennell), comb. nov. *P. triflorus* Heller, subsp. *integrifolius* Pennell, Acad. Nat. Sci. Phil. Mon. 1: 252. 1935.

PENSTEMON GUADALUPENSIS Heller, var. **Ernesti** (Pennell), comb. nov. *P. guadalupensis* Heller, subsp. *Ernesti* Pennell, Acad. Nat. Sci. Phil. Mon. 1: 251, 252. 1935.

GERARDIA FLAVA L., var. **reticulata** (Raf.), comb. nov. *Aureolaria reticulata* Raf., New Fl. Amer. 2: 59. 1837. *Dasystoma bignoniiflora* Small, 1899.

GERARDIA GRANDIFLORA Benth., var. **cinerea** (Pennell), comb. nov. *Aureolaria grandiflora* (Benth.) Pennell, subsp. *cinerea* Pennell, Proc. Acad. Nat. Sci. Phila., 73: 510. 1922.

ELYTRARIA **acuminata** (Small), comb. nov. *Tubiflora acuminata* Small, Fl. Se. U. S. 1082, 1338. 1903.

LIATRIS **Langloisii** (Greene), comb. nov. *Laciniaria Langloisii* Greene, Pittonia 5: 58. 1902.

APLOPAPPUS **annuus** (Rydb.), comb. nov. *Sideranthus annuus* Rydb., Bull. Torr. Bot. Club, 25: 472. 1898.

APLOPAPPUS **validus** (Rydb.), comb. nov. *Isopappus validus* Rydb., Brittonia 1: 100. 1931.

ASTER **linearis** (Greene), comb. nov. *Machaeranthera linearis* Greene, Bull. Torr. Bot. Club, 24: 511. 1897.

IVA **pedicellata** (Rydb.), comb. nov. *Cyclacharna pedicellata* Rydb., N. A. Fl. 33: 10. 1922.

EVAX **nivea** (Small), comb. nov. *Filago nivea* Small, Bull. Torr. Bot. Club, 24: 333. 1897.

POLYPTERIS macrolepis (Rydb.), comb. nov. *Othake macrolepis* Rydb., Bull. Torr. Bot. Club, **37**: 332. 1910.

POLYPTERIS robusta (Rydb.), comb. nov. *Othake robustum* Rydb., N. A. Fl. **34**: 60. 1914.

ACTINEA RICHARDSONI (Hook.) Kuntze, var. *floribunda* (A. Gray), comb. nov. *Actinella Richardsoni* Hook., var. *floribunda* A. Gray, Mem. Amer. Acad. n. ser. **4**: 101. 1849.

ACTINEA texana (Coulter & Rose), comb. nov. *Actinella texana* Coulter & Rose, Bot. Gaz. **16**: 27. 1891.

DYSSODIA gracilis (Rydb.), comb. nov. *Thymophylla gracilis* Rydb., N. A. Fl. **34**: 176. 1915.

CIRSIUM Helleri (Small), comb. nov. *Carduus Helleri* Small, Fl. Se. U. S. **1307**, **1341**. 1903.

STEPHANOMERIA neomexicana (Greene), comb. nov. *Ptiloria neomexicana* Greene, Bull. Torr. Bot. Club, **25**: 123. 1898.

TEXAS AGRICULTURAL EXPERIMENT STATION,
Sonora, Texas.

EPIGAEA REPENS, forma *PLENA* in Connecticut.—Rarely, nature challenges the horticulturist by producing a double form of a wild flower. Such a form of the mayflower has been known at least since 1872 and has been named *Epigaea repens*, f. *plena* Rehder. It has been found at two stations each in Massachusetts and Maine, but seems not to have been reported from Connecticut.

It is therefore of interest to record its occurrence in that state. It was found in 1928 in the township of Madison by Esther Byington-Lindquist. The colony has been under observation regularly since and has consistently produced exquisite double blooms each year. Like constancy was noted in the plants found in 1872 in Massachusetts. The flowers have twelve or more small petals growing like dainty rosettes; they are not as large as many of the single blooms.—E. H. BYINGTON, Guilford, Connecticut.

Volume 38, no. 454, including pages 333-372 and plates 437 and 438, was issued 17 October, 1936.



Photo. E. C. Ogden.

MALAXIS BAYARDI: FIG. 1, four plants (TYPE), $\times 1$; FIG. 2, portion of raceme, $\times 10$.
M. UNIFOLIA: FIG. 3, raceme, $\times 1$.

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